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FRANZ THEODORE STONE LABORATORY

DOMINION SHAD FISHERY COMMISSION

1908-1910.

REPORT AND RECOMMENDATIONS

WITH INTERIM REPORT, PRECIS OF EVIDENCE AND SEVEN APPENDICES.

ONTARIO FISHERIES RESEARCH LABORATORY

COMMISSIONERS:

Mr. SIMON MELANSON, Moncton, N. B.
Mr. SAMUEL F. MORRISON, Halifax, N.S.

PROFESSOR EDWARD E. PRINCE, Ottawa, Chairman.

OTTAWA
GOVERNMENT PRINTING BUREAU
1910

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DOMINION SHAD FISHERY COMMISSION, 1908-1910.

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DOMINION SHAD FISHERY COMMISSION, 1908-1910.

REPORT AND RECOMMENDATIONS.

PART I.

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PREFATORY NOTE BY THE CHAIRMAN OF THE COMMISSION.

The report of the Shad Fishery Commission, consisting of Mr. Samuel F. Morrison, of Halifax, Nova Scotia, Mr. S. Melanson, of Moncton, New Brunswick, and myself as Chairman officially representing the Department of Marine and Fisheries on the Commission, is divided into three parts, viz.: Part First, the complete and final report containing an historical account of former conditions obtaining in the Shad Fishery not only of the Bay of Fundy, but of the easterly and northern shores of the Maritime Provinces, and condensed views as to the changed condition of the fishery, the causes thereof, and a mass of detailed matter, condensed from the evidence and from official reports and records, all bearing on the principal points which the Commission were instructed, by the Honourable the Minister of Marine and Fisheries, to investigate. Numerous extracts from the evidence are inserted in the report, much of this evidence given by witnesses of long experience, and in many cases of very great age. Some of the Shad fishermen who appeared before the Commission were over ninety years of age, and many were over eighty. The value of testimony from such venerable men needs no comment.

Part Second embodies the recommendations, and the conclusions on which the Commissioners came to a unanimous decision; while Part Three is an Interim Report, presented during the progress of the Commission, on certain urgent points which seemed to call for attention prior to the completion of the main report and recommendations.

I feel bound to add, in justice to my able colleagues, Mr. Morrison and Mr. Melanson, that no chairman of a Commission ever had more earnest and hard-working Commissioners, possessed of great practical knowledge and experience which are so invaluable in pursuing an inquiry with so many aspects and complicated phases as the shad fisheries of the Atlantic coast of Canada. The Salmon and Gaspereau fisheries, it may be added, also find a place in the report.

EDWARD E. PRINCE, *Chairman.*

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PART I.

REPORT OF THE DOMINION SHAD FISHERY COMMISSION

1908-10.

OTTAWA, May 28th, 1910.

Hon. L. P. BRODEUR,
Minister of Marine and Fisheries,
Ottawa.

SIR,—The undersigned Commissioners have the honour to present their complete and final report and recommendations on the shad fisheries of the Bay of Fundy and tributary waters.

The Commission was appointed on June 4th, 1908, in accordance with the representations contained in the following official memorial forwarded to the Honourable the Minister on April 2nd, 1908:—

Hon. L. P. BRODEUR,
Minister of Marine and Fisheries,
Ottawa.

The memorial of the undersigned members of the Legislative Council and of the House of Assembly of Nova Scotia respectively, humbly showeth.

That your memorialists are representatives of six counties adjoining the Bay of Fundy and its tributaries, where a large and lucrative business was formerly conducted in the taking and curing of shad, but which from causes unknown has so far declined that it is now of little value.

That the industry in former years gave employment to hundreds of fishermen and called for profitable investment of a large amount of capital. Your memorialists are of opinion that the causes of the failure of such an industry should, if possible be discovered and made a matter of record.

That the shad are a migratory fish, visiting the waters of the Bay of Fundy, as popularly understood by two migrations. The first during the months of April and May being known as the spawn shad which find their way into fresh water rivers emptying into the Bay of Fundy and its different arms; the second during the months of June and July confining their movements to the salt water bays and arms, the latter being the fish known to commerce.

That these fish in each of their migrations first appear in Canadian waters at the mouth of the St. John river, St. Mary's bay and Annapolis basin, gradually working their way up to the head tidal waters some two or three weeks later.

That your memorialists have recently conferred with Professor E. E. Prince, Commissioner and General Inspector of Fisheries for Canada, respecting the matters referred to in this memorial, and have learned that no purely Canadian data exist in the department at Ottawa respecting shad.

That the older people who are most familiar with the habits of the shad and its great value as an industry many years ago are fast passing away and much information obtainable from them necessary to intelligently give effect to restorative measures, will be lost unless secured without delay, and as no inquiry has been officially made with respect to the shad fisheries in Canada, in the opinion of your memorialists it is advisable that a commission be forthwith issued, composed of maritime province men, to investigate all matters and things touching this industry.

Your memorialists, therefore, humbly request as follows:—

That a Commission of inquiry be granted to collect information touching the above mentioned fishery:—

1. As to its history.
2. As to its development.
3. The period of its best condition.
4. When it began to decline.
5. As to the cause of its decline.
6. Methods of taking and contrivances therefor.
7. Time when they first appear at different places.
8. Habits and food of fish.
9. Spawning grounds and artificial breeding.
10. Enemies and obstructions in rivers.
11. Curing and marketing fish.
12. Suggestions for preservation, restoration and improvement

and that the hatchery at Windsor be put in operation the present season for hatching shad spawn. And your memorialists will as in duty bound ever pray.

M. H. Goudge, M.L.C.
Amos B. Etter, M.L.C.
Alfred P. Welton, M.L.C.
C. N. Cummings, M.L.C.
Henry N. Robicheau, M.L.C.
O. T. Daniels, M.P.P.
W. D. Hill, M.P.P.
Jas. O'Brien, M.P.P.
E. P. Paul, M.P.P.
Chas. S. Wilcox, M.P.P.
B. H. Dodge, M.P.P.
C. H. Campbell, M.P.P.
A. M. Gidney, M.P.P.
J. A. Bancroft, M.P.P.
B. F. Pearson, M.P.P.
William T. Pipes, M.P.P.

Halifax, N.S., April 2, 1908.

For over twenty years representations have been made to the Department of Marine and Fisheries, Ottawa, on the declining condition of the shad industry, and the fishery inspectors, especially the former Fishery Inspector at St. John, and Inspectors Hockin and Chapman, have reported fully on many occasions on the necessity for protective steps, but there appeared to have arisen difficulties in the way of action, and no legislation in that direction was enacted. At a conference of Dominion Fishery Inspectors held in Ottawa, on April 9, 1891, the state of the shad fishery was discussed and a recommendation agreed upon. (See Appendix No. 1). In May, 1894, a petition bearing 611 signatures from residents and fishermen along Copequid Bay shores was received, in which four points were emphasized:—

1st. The former great value of the shad industry, three to five thousand barrels of shad of a value from thirty thousand to fifty thousand dollars per annum being the yield along thirty-five miles of the Colchester coast line.

2nd. In later years the fishery had seriously declined, so that in the same territory not more than from two hundred to five hundred barrels per year were taken.

3rd. The cause of the decline was stated in the petition to be the destruction of spawn shad in Shubenacadie and Stewiacke rivers, this destruction being of comparatively recent date.

4th. The petition urged that shad should be protected by a close season similar to that carried out in regard to salmon, so that the taking of shad during the spawning time might be strictly prohibited.

Later several petitions were received.—one on April 21st, 1902, bearing a large number of signatures from the same localities before mentioned and also including

Hants county, reiterating the points stated in the former petition and suggesting that a close season for shad should be established from August 15th in one year to June 15th in the year following. The petitioners urge that immediate action should be taken and that the restrictions should apply to the Bay of Fundy and tributary rivers.

These petitions indicate the general feeling along the shores in question, as the condition of this important industry for the last twenty or twenty-five years has been a matter of great concern to the whole population resident along the coast of the Bay of Fundy, and the appointment of the present Commission, with full authority to investigate the shad fishery in all its aspects, has met with the warm approval of the public generally.

Few persons not resident in the Lower Provinces can realize the importance of the shad industry, and that the possibility of its total decay and disappearance is a matter of such deep and widespread concern. Previous to the appointment of the present Commission no data other than those contained in the usual official reports have been available, though, as already pointed out, certain fishery officers have from time to time urged the necessity of some effective measures.

The necessity of a thorough investigation and the collection of information, especially from old shad fishermen, most of whom are rapidly passing away, had been universally recognized in Nova Scotia and New Brunswick, and the wisdom and propriety of the action of the Honourable the Minister of Marine and Fisheries in authorizing a Dominion Commission to hold sittings to hear reports from interested parties and to inquire generally into the fisheries in question have been hailed with satisfaction all along the Bay of Fundy and adjacent Atlantic shores. As a leading resident of Truro, N.S., assured the Commissioners in his evidence, "I don't think that the Commission has started any too soon," while a prominent witness at Bass river, N.S., declared, "I do not think any one could call this Shad Commission a failure. I felt it was the very thing required. The decline of the shad was serious in many ways." At St. Martins, N.B., an important witness, Mr. A. F. Bentley, gave striking testimony on the same lines. He said:—

I fished shad long ago in Nova Scotia at Five Islands. I consider shad one of the most valuable of all our fishes. Fifteen or twenty years ago it was a remunerative fishery for the fishermen and valuable to the public. Thousands of barrels were caught. It was the thing which brought money to the people, and some fishermen I know realized as much as $2,000 a season from shad fishing. I moved down here, but I hear that shad are now very scarce, bring $8 to $11 per half-barrel, but some seasons as high as $12 a half-barrel. I consider shad to be one of the best fish. Fresh there is no better, and salted it is equal to mackerel. As a boy I remember that 4 cts. was the price of a shad and later 25 cents. If the government can do anything to increase the shad they would be doing one of the best things that could be done for the people.

On similar lines Inspector H. E. Harrison, in his official report, 1908-9, p. 118 said:—

Regarding these splendid fish I have to make the same report as last season. It is useless to speculate as to the cause of the deterioration in this fishery. Possibly regulations allowing a very limited fishing season for shad, might in time bring it back to something like its former proportions, otherwise it seems to be going the way the great sturgeon fishery of the St. John river did some years ago. I sincerely

trust that the Commissioners appointed last year, and who collected information on this matter may be able to suggest some remedy.

Again, Inspector R. A. Chapman, Moncton, N.B., said, in his report, 1908-9:—

More of these shad in the past few years come up into our fresh water streams, at the head of the Bay of Fundy to spawn then previously; but no real improvement can take place with this fishery until a close time is made and enforced while they are spawning. I do hope that the recent commission may lead to something along these lines.

Decline of Shad Fishery a Loss to the Country.

At the sittings of the Commission important witnesses laid stress on the serious loss to the whole community resulting from the present deplorable condition of this once important industry.

The following extracts from the evidence abundantly demonstrate the fact, and in this prevailing opinion the members of this Commission fully concur.

Prominent merchants, fish dealers and fishermen united in the view, as one leading witness said that "the decline of the shad is a great loss to the country. One or two boats taking 200 or 300 shad at a tide was important. Fourteen hundred have been taken at one tide and that meant quite a little cash value indeed, $50 to $100 per day to the community."

Another witness asserted that "the fishery was a means of circulating an immense lot of money, because country people came in and bought hundreds of shad before breakfast. They took one or two barrels each and bought for their neighbours, so there was a great sale. I often had my pockets then full of ten cent pieces. I built boats and greatly feel the loss; the decline is a calamity."

Again, a witness informed the Commission that the "Five Islands people made their living shipping shad and potatoes, and got winter supplies from their earnings, as very little lumbering was done then. All the way along the coast from Economy it was their mainstay for the greater part of the people, and some made a pile of money."

Other extracts from the evidence given by various witnesses may be added:—

The rivers have been overfished and the natural supply cut off. To the dealer the decline made great havoc with his business, it was a calamity in our financial affairs on this shore. We can hope for nothing unless there is an entire cessation of the destruction of fish and after that the proper regulation of the annual catch. Though I never fished in my life, my grandfather fished shad; but it is the concern of everybody. A radical measure only will work any real good.

I would like to see shad fishing restored, as there were fully sixty farmers, I think, fishing forty years ago. They would catch from ten to twenty-five barrels in a season with a twelve fathom net. The net was sixty meshes deep.

The shad is a valuable fish, and there should be something done to restore it. Shad have become so scarce that people here have dropped it altogether, they can't get them.

It was a great industry formerly and I packed seventy-four half-barrels of shad in four days out of eight hauls. It would be a source of much profit to the people here if it were restored again.

The shad had declined to a serious degree. The restoration of the shad would be a public benefit of the greatest moment. The fishery gave employment to a great

many resident people for a part of the year; it was a remunerative occupation, and it furnished a cheap and greatly esteemed food to the people.

There should be a law for the shad like that for the salmon as it is worth ten times more than the salmon.

Finally, one witness of over sixty years' experience in connection with the shad fishery in Minudie bay, said that:—

The shad fishery was an important industry, and I think that it would be a good thing to have it restored.

In connection with this universal opinion along the Bay of Fundy shores that the shad fishery ranked as the leading industry in these waters, a detailed letter written by Mr. Amos Seaman, of Minudie, on September 11th, 1850, to Dr. M. H. Perley, is of very great value and interest. The letter is of exceptional historical importance and furnishes most interesting information as to the extent of the shad fishery from 1835 onwards, the methods of taking the fish adopted at that time, the mode of curing, the markets, and the prices, &c.

The letter is as follows (we quote from Dr. Perley's work, pp. 152-3):—

MINUDIE, September 11, 1850.

SIR,—In answer to your circular of August 12, relative to the fisheries at the head of the Bay of Fundy, I beg leave to say, that I will furnish such information as is in my power, relative to the shad fishery, which is the only kind successfully followed in the bays and rivers around here.

It is only about fifteen years since any attention was paid to this business. At first, standing weirs were employed; but owing to the circumstances of large quantities of inferior and small fish being caught, the raising of the flats, and other undefinable causes, this mode has for some years been discontinued. The only methods now practised are by set-nets and drifting; by the latter, far the largest quantities are taken: sometimes may be seen in Dorchester bay, and around the shores of Minudie, upwards of two hundred boats out at one time. The boats leave the place of rendezvous with the ebb tide, drift down to the bay until they meet the flood, and return with it to the place from when they started. With favourable tides each boat will secure from 100 to 150 shad, with 80 to 100 fathoms of net. The fishing season commences in June and terminates in September.

When we consider the great number of nets that are set, almost every resident on the shores having one, and some four or more—besides others who come from miles inland to embark in the business—as well as the great number of boats constantly out drifting, it is not perhaps too much to say, that from five to six thousand barrels are caught and cured every season. When properly put up, in barrels of 200 pounds weight, with care in curing and packing—the fish being split down the belly, the back bone taken out, and the tail cut off, which is the method preferred by the American merchant, and now followed by many of our fishermen these shad will command from nine to eleven dollars per barrel, in the American market; leaving from six dollars and a half to nine dollars and a half to the exporter, after duties and charges are deducted.

It is but a very few years since any shad were prepared for shipment, the people who followed this fishery being content with securing sufficient for their own wants, and perhaps a barrel or two for their neighbours. But the fame of our shad went abroad, and some American merchants were induced to try them in their market; they were highly prized and sought after. From that time, exportations were yearly made, and have gone on steadily increasing. At the present time, there is a great demand for shad caught at the head of this bay, as being of superior quality—much fatter and of more delicious flavour than any found on the American shores, or in the markets of the United States.

This demand and encouragement, have had a wonderful effect in stimulating our fishermen to increased exertions, and greater care in curing, so that the fish may command the highest price, and sustain their character. That the supply is inexhaustible, is plain to every one; for, notwithstanding the number of persons employed, and the means for capture have greatly increased within the last few years, there appears not the least diminution in the quantity of fish—none complain. If the contemplated railroad were now in operation, and the Canadian market, now shut to us by circuitous navigation, should be rendered easily accessible, a large field would be opened for our fisheries. The energies and enterprise of our fishermen would receive additional excitement, and the whole trade would flow in that direction to avoid the heavy duty of one dollar per barrel exacted by the American government. We consider our shad fishery to be only in its infancy; and not a doubt can be entertained, that when a larger field is opened, and improvements introduced in the modes of capture and cure, that the trade will become extensive, of great importance, and highly lucrative.

You will perceive, that all my observations have been confined to the shad fishery, in and around Minudie, and the neighbouring bay of Dorchester, at the mouth of the Petitcodiac. The same fishery is carried on along the coast to Chignecto, and about the shores of Parrsboro', and no doubt equal quantities are caught there; but for more full information, I must refer you to persons in those localities.

I have nothing to say as to other fisheries here, they being too insignificant to demand even a passing notice. With my desire, that the foregoing may be found useful and satisfactory.

I have the honour, &c.,

AMOS SEAMAN.

M. H. PERLEY, Esq.

Nothing demonstrates the decline of this fishery more emphatically than a comparison of the present small number of boats and men engaged as compared with the larger fleets of boats and the numerous body of fishermen who followed shad fishing thirty or forty years ago.

Thus, at Wood point, N.B., according to Captain Peckham's evidence, we find that about 1875 there were forty boats fishing in a distance of two miles; but the number is insignificant now, while at Pre d'en Haut in the early seventies, from 130 to 140 boats fished in a distance of about ten miles, 37 of them going out from one landing, at which landing at present one boat only is engaged in fishing.

From Port à Pique to Economy point, a distance of ten to fifteen miles, there were upwards of 90 boats, as one witness described it, "they were thick like black ducks," but now only 10 or 12 boats in the bay here. Another witness added that there was not a boat fishing from Economy at present.

Historical References.

Early records establish beyond question the abundant and widespread distribution of shad along the Atlantic shores, bays and rivers of North America. When the English colonists settled what now constitutes the Eastern States they found the shad to be one of the most abundant of all the food fishes frequenting the estuaries, rivers and bays referred to. The famous William Penn, in a letter to the Duke of York dated Philadelphia, January 9th, 1683, gave the information that—"our rivers have also plenty of excellent fish and water fowl, as sturgeon, rock, shad, herring, etc." Few incomers from Europe were previously acquainted with the shad, which is very rare along the shores of the German ocean, though abundant in the Severn,

in the West of England and in the Thames and other rivers. Of the British shad two kinds have been recognized—the Severn shad, four to five lbs. in weight, which ascends from the sea to spawn in April, and the Twaite shad, a smaller species found in the Thames and which was at one time exceedingly abundant in that river, but is now almost extinct. The New England colonists soon learned to appreciate the excellence of the American shad and in some territories it became a staple food. There were, however, criticisms as to the poor condition of some of the shad caught after spawning, on account of their bony condition, and, as Judd stated in his history of Hadley, Massachusetts, these shad were despised and rejected as not being suitable for food. Mahlon Stacey, one of the first settlers in New Jersey, wrote in 1680 to his brother in England, "Though I speak of herrings only, lest any should think we have little of other sorts, we have plenty of most sorts of fish that I ever saw in England besides several sorts that are not known there, such as rocks, catfish, shads and sturgeons."

There are many early Canadian references to the existence of shad in our waters and the Commission is indebted to the Dominion Archives Department, especially to Dr. A. G. Doughty and Mr. Placide Gaudet, for references as to the mention of shad in certain old historical records. Thus, in a sketch of the Province of Nova Scotia by Judge Deschamps, dated in the year 1782, speaking of River Habitants, Kings county, N.S., he says, "In July and August this river affords abundance of fish called shad." A further early reference is to be found in the Nova Scotia Historical Society's publications and in a letter dated March, 1791, to the Rev. Dr. Brown of Halifax from the Rev. Hugh Graham of Cornwallis, N.S., he states: "In this heterogeneous piece I shall tack a short account of the average amount of the shad taken in Cornwallis, yearly.

AMOUNT OF SHAD CAUGHT IN HABITANTS' RIVER.

Year.	*Amount.*
1789	120,000
1790	70,000

N.B.—I have fished in them two years with a seine in H. River, yearly average, 95,000. Began to fish in Canard river in the year 1787. Caught in—

1787 upwards of	100,000
1788 "	100,000
1789 about	70,0000
1790 "	70,0000

Canard river yearly average, 85,000.

Yearly average of the creeks taken by seines, 25,000.

Was planted in Cornwallis river 90 seines, but did not succeed well.

Caught about 15,000.

This one is not likely to succeed, as the force of the current is too great for the same. But on a moderate calculation there is upwards of 150 ordinary shad to fill a barrel; price of not salted, 15 shillings; salted, £1 5 shillings."

All the testimony recorded in documents, now available, historically establishes the fact that shad were abundant all along the eastern shores of this continent as

far north as the St. Lawrence, up which they ascended above Montreal, and are stated on reliable testimony to have even been taken in the Ottawa river, ascending almost to the site where the federal capital now stands.

The Commission had the advantage of hearing personal testimony from witnesses far advanced in years fully confirming the statements as to the plentitude of shad in former days especially in the Bay of Fundy. Mr. Jas. Fleming, Folly Village, N.S., 93 years of age, said that he remembered the time, 65 years ago, when shad were very thick. The witness was referring to the Colchester county shore, Cobequid bay, and similar evidence for the opposite, Hants, shore was given by Mr. Isaac Douglas of Maitland, 86 years of age, who said: "In 1837 men easily filled their small boats, getting three or four hundred shad on a tide. Every one who had a boat then fished and got all he could handle. There was no trouble to get fish." The same venerable witness added, "My grandfather said the bay was alive with fish, it was swarming with shad." Mr. J. G. MacLellan of Noel shore, N.S., said he had known the shad fishery for over 60 years and long ago these fish were very plentiful, but his grandmother before him spoke of their abundance when she first came to Noel. She told of a brush weir set from one bank of a creek to the other bank and it was filled to the top level of the brush wall with fish. They were large shad, 80 would fill a barrel. That was 125 years ago and the place was called Shad Creek in consequence. Mr. R. T. Keillor at the Amherst sitting related a story that over a hundred years ago there was a net put in on Amherst creek and it filled up with such a great catch of shad that it broke; the creek was full of shad.

The idea prevailed that the supply of this valuable fish could never be exhausted, though even in the early years referred to there were fluctuations, that is, poor seasons when fish were less plentiful, but never the scarcity which exists to-day.

In the letter written to Dr. Perley by Amos Seaman of Minudie in 1850, we find he entertained this opinion, as he says "that the supply is inexhaustible, is plain to every one: for notwithstanding the number of persons employed, and the means for capture have greatly increased within the last few years, there appears not the least diminution in the quantity of fish—none complain."

The early settlers along the Bay of Fundy, especially on the shores of Cobequid bay, adopted the most primitive methods of securing supplies of shad. The fish were so abundant that large captures were easily made, especially from tidal pools on the wide sandy flats, where such simple means as pitchforks, and later spears, proved effective for procuring supplies for domestic use. One witness said, "Shad were got on the flats in holes or pools left by the tide. We speared them and got as many as we could carry on our backs; the flats were alive with shad." Brush weirs were soon adopted in these early years, and Mr. Adolphus Bishop stated:—

That he had fished shad from the age of 16 and he was now 80 years old. Sixty-seven years ago, when he was twelve, he remembered the first weir made of brush, at Ellison Point, near Starr's Point. The owner caught more shad than he could use, as much as two yoke of oxen could draw. There were big seines, drift nets, pollywogs, &c. There were four seines at Four Island, Boot Island, &c. Big fisheries were at all these places. Everybody caught hundreds and thousands of shad.

Later, nets came into use and one of the earliest instances appears to have been the adoption of the net on the Petitcodiac river, N.B., about one hundred years ago. Mr. Dennis Richard of Pre d'en Haut said:—

I knew the first man who caught a shad in the Petitcodiac river. His name was Dawson Steeves. He made a net five fathoms long and drifted about three miles on the river and got five shad going up, and drifting down he got five more. That was about 90 or 95 years ago. Mr. Steeves himself told me this and said it was the beginning of shad fishing in this river.

The use of nets appears to have been adopted a little later on the N.S. shores and on Cobequid bay, very short lengths seem to have been first used. As Mr. Douglas said:—

Then small nets were used, 35 fathoms long (one bunch). That was in 1837, and the men easily filled their boats getting 300 or 400 shad on a tide. William Lawrence, as a young man, built a boat and secured 38 barrels his first season. Every one who had a boat then fished and got all they could handle. There was no trouble to get fish.

The limited fishing operations above mentioned was carried on for domestic and local use, and the first genuine commercial enterprise dates back about 70 years. The pioneer commercial shad fishermen were the Messrs. Halliday of Halifax, N.S., and in the evidence of Mr. George Gregoire of Halifax this early net fishing is described. He said:—

I remember shad fishing in the Bay of Fundy from the time I was a boy say of twelve years of age, sixty-three years ago. In the year 1845, I was working with Mr. Tristram Halliday, of Halifax, who was a dealer in fish and the first canner of fish in this country. Mr. Halliday was a Scotsman, and had been fishing shad in the bay two or three years before I joined him. That year I had been fishing with him down to the eastward, and left there to assist in shad fishing in the bay. I arrived here on June 24, which was my twelfth birthday. The boats were then being left there from the year before. We took nets with us. The boats were bought in New Brunswick, and were skiffs. We fished seven skiffs that year, our buildings being on Daniel Hill's property at Economy Cove. Each net was sixty fathoms long, four nets to a gang. The nets were made of fine mullet twine and knit by our own men in the factory in winter. The size of the mesh was 5 inches and 45 meshes deep, mounted on a top rope with floats, on a third extension of the mesh. The bottom rope had sinkers. We fished at night by drifting up the bay on flood tide, returning on the ebb tide going down past our own place to low water and coming back home on the flood tide. We usually picked our nets three times at night. In those years and up to 1856-7, with the gear described and the time spent in drifting we would kill from 400 to 600 or 700 shad in a night. They were all big fat No. 1 shad. The first year I went to fish shad we arrived at the fishing grounds on June 24, and got to work fishing July 1. At this time there was very little fishing done outside of Mr. Halliday's Company. One or two farmers had short nets and worked a little at it.

By 1852 the drift nets had increased in length and the industry had begun to expand. As Mr. Gregoire said:—

As soon as a boat couldn't bring in more than 300 shad of a night Mr. Halliday would stop fishing. I fished with Mr. Halliday seven years. I worked in the factory at Halifax with him when I wasn't working with the canners, and I helped to knit nets. After this I fished nine summers with Mr. John O'Brien, of Noel. We used the same sized mesh and 400 fathoms of net. I used to kill from 400 to 700 shad a night. When the shad fell off to 200 at a catch I stopped. I fished by the hundred, at $1 per hundred.

About this time on the Petitcodiac river, as Mr. Dennis Richard says, "We used a net 150 fathoms long, the mesh being 4½ inches; then it came down to 4¼ inches.

and it is now 4½ inches. We commenced with 47 meshes deep, but it is now 65 meshes."

Periods of Best Condition of Fishery.

We cannot ignore the statements that in former years, 40 to 50 or 60 years ago, shad in some seasons were less plentiful than in others, but the present dearth of shad must be regarded as due to other causes than such fluctuations. The serious fact must be faced that for 25 or 30 years there has been a marked decline in the supply of shad, while during the last ten or twelve years the fish have been alarmingly scarce, and in such places as Scott's bay, where in 1897 45,000 shad were taken in one night in a stake seine; in 1908 the actual catch in the seine mentioned was not more than 200 for the whole season; while at the time of the visit of the Commission to this locality, the seine in question only secured three shad at one tide. The only fishery yielding returns of consequence at the present time is that carried on up the rivers in non-tidal waters where the last remnants of the shad spawning schools ascend for breeding purposes. The shad fishery in the tidal waters of the bay is still carried on, but the success of the fishing depends not so much upon the shad taken as upon the salmon secured in the same nets.

There can be no question of the general abundance of shad formerly in view of the remarkable testimony referred to in the preceding pages, and during the period of the American civil war the shad fisheries of the Bay of Fundy yielded large returns and were most energetically carried on. The main catches were salted and shipped to the American markets. The statement of Mr. Rogers, Scott's Bay, that in 1842 big catches of 50,000 shad were secured at that place and in 1844 155,000, abundantly proves the plentitude of the fish; and from 1856 to 1885 the same witness stated that there was good average fishing. Mr. Herbert Tupper, Scott's Bay, informed the Commission that in 1872 three stake seines took 100,000 shad. The extraordinary catches in that bay appear to have depended to a large extent upon weather conditions, such as wind, etc.; with a west wind and roily water the best catches were made, such as the 45,000 shad taken in a weir on July 17, 1897. Mr. Rogers stated that under such weather conditions the shad came along the north shore into the bay and good catches were certain, but if the water was not roily shad would not be taken in quantity.

Of course no systematic method of recording statistics existed in the early days of the shad fishery and detailed figures are lacking for these early years. Indeed in an official report to the Department of Marine and Fisheries in 1869, it is pointed out that "it is very difficult to get even an approximate statement of the catches of shad." In 1860 the Census returns for Nova Scotia gave the quantity of shad cured in that province, the total being stated as 7,649 barrels. This quantity was made up as follows, the counties contributing being:—

Colchester	3,691
Kings	1,274
Hants	1,078
Cumberland	652

(See Appendix 5 for the detailed table of shad and salmon catches, 1861.)

At the sitting of the Commission at Folly village some interesting figures were given of the catch of shad from Little Dyke, Cobequid bay, of the Hon. C. N. Cummings, who said:—

That he was 75 years of age and had all his life been acquainted with the shad fishery. All the local people used to go out upon the flats and spear shad there, and carry the fish ashore. Then small short nets began to be used. Mr. Thos. Corbett got a short net, over 60 years ago, and old Mr. James Johnson, of Debert, got one, but Mr. Halliday, of Halifax, came to Economy cove with six or eight boats and used longer nets and got immense catches. He had buildings at Patty Hill's Cove. He used 15 or 16 bunches of net to a boat. The mesh was 4½ to 5 inches, the same as was used for salmon. I can give to the commission my catches of shad from 1864 to 1870, and we used 16 bunches of new nets—three bunches being sixty fathoms:—

1864	6,500
1865	9,060
1866	11,600
1867	4,513
1868	9,146
1869	5,105
1870	5,067

At the same sitting Mr. T. W. Morrison handed in a statement of individual catches of shad and salmon made by Mr. T. F. Morrison for several years, which are of special interest in this connection. Mr. Sargent Stewart also furnished the Commission an interesting record of his own individual catches of shad and salmon for the year 1908. These two statements of catches afford a striking contrast and forcibly demonstrate the unquestionable decline of the shad supply. (See Appendix 3 and 4). Mr. Isaac Faulkner, of Princeport, referred to the extent of the shad fishery in 1860 and said that subsequently—

'for years fishing was good, 5,000 to 7,000 to a boat. In 1879 they were more plentiful than I remember. I fished for Lindsay Moore and got 14,000 in five or six weeks. Joe Taylor got 21,000 off Economy in that time. I fished 25 bunches, 4¾-inch mesh and later 5-inch. Masstown fellows got two weeks' fishing before us. Fishing was from Masstown to Parrsboro on our side, and Maitland to Windsor on the opposite shore. In 1879 I got 1,200 shad in one night's fishing. In 1880 I get a total of 6,000, but in 1881 not half so many. Fishing has never been good since, though 10 or 12 years ago it was 3,000 and it has dwindled till it is small fishing.'

Record of some Shad Catches, 1869-1908.

The following tables of shad catches in Nova Scotia and New Brunswick by counties, each total of barrels being for every fifth year, not every year, from 1869 to 1908, confirm the decline of the shad:—

NOVA SCOTIA.

Year.	Cumberland Co.	Colchester Co.	Hants Co.	Kings Co.	Annapolis Co.	Digby Co.	Yarmouth Co.	Richmond Co.	Lunenburg Co.	Queens Co.	Guysboro Co.	Shelburne Co.	Cape Breton.	Total number of barrels and value.
1869	901	2,008	923	2,156		100								6,188 $49,800
1870	550	1,941	1,851	1,845	10		15					2		 $55,920
1873	950	1,671	1,050	700	20	150	4		57		5		5	4,012 At $8, $36,896
1874														
1876														
1878	1051	3,083	795	1,748	10	515		5	35				3	7,245 $57,960
1883 1884	868	966	503	355		145	42				9		52	
1888 1889	112	201	222	418	5	3	8		14	25			4	473 $47,300
1893	241	270	232	388	80	98	70			5	600		8	1,995 $19,950
1898	533	*1,657	587	993		202			150				3	4,125 $41,250
1903	152	1,938	19	18	20	52	1,000			16	4		265	3,486 $34,860
1908	83	25	45	26	115		80	10			22	150	42	598 †† $5,980

* Of this quantity 550 barrels taken in Stewiacke river as compared with 408 at Economy and 487 at Bass river and Highland village.

††The value per barrel it may be noted was really $20 *i.e.*, $12½ per half barrel.

NEW BRUNSWICK.

Year.	Northumberland Co.	Westmorland and Albert Cos.	Carleton Co.	York Co.	Kings, Queens and Sunbury Cos.	Victoria Co.	St. John Co.	Gloucester Co.	Kent Co.	Charlotte Co.	Total number of barrels and value.
1869		46,614 fish					1,500				$3,000
1870		3,783 bbls.									$42,264
1873	63	2,105	40	300	88		300				2,896 At $8, $23,168
1874											4,749 $37,992
1875											6,419½ $51,356
1876	442	2,065	17	15	273	8	2,050				4,870 $38,960
1878	28	4,290		15	304	10	100				4,747 $37,976
1883	No figures for 1883.										
1884	81	1,679	125	40	961	50	1,268	56	45		4,305 $34,440
1888 1889	21	1,235	50	30	970	25	1,560	5	19		3,855 $38,550
1893	570	1,019	50		1,102	20	2,000	49	245		5,055 $50,550
1898	1,600	2,210	25		1,060	30	810		65	5	5,805 $58,050
1903	2,200	1,450	25	150	655		860	50	130	60	5,580 $61,250
1908	1,020	1,415	6	9	400		530	122	120	73	3,699 $41,457

Geographical Range of the Shad.

The Bay of Fundy shad have been always regarded by those qualified to judge as the best of all shad, especially the summer shad, called in some localities fall shad. These summer shad frequent the muddy flats of the bay during the months of July and August. On these flats they acquire, not only a rich fat quality, but an excellence of flavour not equalled by the shad taken in any other locality. But the schools of shad have a wide distribution along the Atlantic Coast. Indeed from the Mexican Gulf to the St. Lawrence schools of these fish occur or have occurred. Nearly every river on the Atlantic coast was invaded by immense schools —Drs. Jordon and Everman said in their work on North American Fishes—and there is good ground for the opinion that hardly a stream on the whole twenty-five hundred miles of the Canadian coast along the Atlantic was not a resort for spawning shad. From the St. Croix to the St. Lawrence, including such vast tributaries as the Ottawa river, ascending schools of shad were noticed, and they were fully utilized by the residents for domestic purposes, as has already been pointed out. This esteemed fish, though less plentiful further south, occurs in some abundance even in the waters of the Gulf of Mexico, but they have been regarded as a different species, and fishery authorities have determined that several species of shad exist. The date of their ascent from the sea also varies. Thus in Florida, in the St. John river of the South, they appear in November and are found in some abundance during the three or four succeeding months, especially in February and March. In the Savannah river and at Charleston, South Carolina, they appear in January and off Norfolk in February; while in the Potomac river, a river long famed for shad, they are first taken in March and April. Later still they appear in the Hudson river, viz., from April to the end of June, and during the same period they are taken in New York bay. In the Delaware river, May is the principal fishing month; while in the Connecticut river they come in from the sea about the middle of April, and are said to disappear again about June 20th. During the later period of their stay they frequent the estuaries and rivers of Massachusetts and Maine. Runs of shad formerly passed up the St. Croix river between New Brunswick and Maine, indeed in an official report in 1868, the river is described as "formerly teeming with shad, salmon and alewives."—(Dept's Rep., 1868, p. 23.)

In the Bay of Fundy the schools of shad appear off Charlotte county shore New Brunswick, in May, and the Lorneville fishermen take them from the middle of May until the 5th of June. They reach the St. John river at the earliest about the middle of April. They ascend the river and are on the spawning grounds by about the middle of May, the best fishing being from May 24th to June 10th up the river—the early June shad, it is claimed, are large fish.

The 'New York Fishing Gazette' (on March 25, 1905) said, regarding the local nature of the schools of shad on the United States shores:

In all there are about 25,000 men employed in the shad fisheries of the Atlantic seaboard of the United States, and it is estimated that about 15,000,000 shad are caught annually. About March 1 the shad usually reach the lower end of the Chesapeake bay, two weeks later they are in the Delaware, and about April 1 they reach New York waters. After remaining for some months they disappear and are not seen until the following year. For years it was believed that the entire body of shad

wintered in the south and started northward in a vast school at the beginning of the year, advancing along the coast like an army, sending a detachment up each successive stream, this division by a singular method of selection consisting of the fish that were bred in those respective streams, the last portion of the great school entering the Gulf of St. Lawrence.

But naturalists now recognize a second kind of seasonal movement termed 'bathic migration,' by which uniformity of temperature is secured far more rapidly, than by moving towards or from the Equator. And the present theory is that the young shad hatched in any particular river remain within a moderate distance off the mouth of that stream until the temperature of the water is suitable for their reentrance. Their appearance first in the extreme southern river of the coast, the St. John's, Florida, and at later dates successively in the more northern rivers seems to confirm this view.

While the chief result accomplished by the migration of shad into the river is the reproduction of the species, yet it appears that their movements are more immediately governed by the comparative temperature of the waters than by the approaching ripeness of the eggs.

It is clear that the various rivers have their own schools of shad, for in the Petitcodiac river shad occur from May 1st to June 25th, whereas on the opposite arm of the Bay of Fundy in Minas basin schools of spawning shad appear about the same time, viz., the last of April. On the Shubenacadie river they even appear earlier, viz., April 17th to May 10th, and have been reported up the river at Elmsdale on May 1st, though it is claimed they do not spawn until June. On the Avon experienced fishermen claim that the earliest date when the shad appear is three weeks later than at St. John river. Again the end of May is stated to be the earliest at Nictaux river, an important branch of the Annapolis river. At Bridgetown, lower down on the same waters (Annapolis river) fishing is chiefly done in May, though evidence at Annapolis Royal indicated that shad spawn in April, and schools in that case must enter the river earlier than May. Further down the Bay of Fundy, at the head of St. Marys bay, they appeared formerly early in May. As one important witness stated:—

Early in the season, in May, there were plenty of spawning shad, many very large fish being taken in brush weirs. The size of shad varied, and big fish were taken in weirs, but 9-inch shad occurred in weirs and traps and even in gill nets. These small fish were thrown away, being no good for market. Three kinds of gear adopted: gill nets which drift at night, and took great numbers of fish, brush weirs in which many early or spring shad have been taken, and seines or deep water traps, really a seine set on stakes fixed in the mud, and often 25 feet long (stakes). The pot or bunt may be 40 feet long and the wings each 120 feet long, while the mesh is small. The food of shad is small insects and eel-grass. They feed in deep water when on the mud. They enter St. Marys bay from the open sea and migrate to the very head of the bay.

As the area covered by the Commission did not extend beyond the Strait of Canso, evidence was not taken at any points further north; but in the testimony of certain witnesses interesting references occur to runs of shad off the New Brunswick and eastern Nova Scotia shores. Thus at Canso catches of Shad are at times made.

Mr. Clem Whitman, of the firm of A. N. Whitman & Sons, fish merchants, Canso, said:—

Shad were not regular, and were of small importance in the local fisheries. Eighteen hundred pounds were caught in 1905 in the haddock nets in May. They

appeared to be coming from Cape Breton. We paid the fishermen five cents per pound for them. They were four or five pounds each. Those we got were probably only part of the total local catch. Some Montreal fish firms got news of the take of shad and at once bought them up eagerly. We sold them for 7 cents or more. In June, 1905, we got a few, 26 pounds total weight.

While Captain Welsh, in his evidence, referred to spawning grounds in Guysborough County. He said:—

That he had fished haddock nets 5¾-inch mesh, mackerel nets, 4-inch, and salmon nets 5¾-inch mesh, and shad were taken at times, chiefly at White head and some at Dover. Mackerel nets take the small sized shad. A good many have been taken on the Cape Breton side of Chedabucto bay. The traps take a few. The other day seven thin, spent ones were taken (middle of August), and lots of very large ones were got this spring in the haddock nets, which the men had made larger mesh, not 5¾ and 5¾-inch mesh, but 6-inch mesh. They were four, six and seven pounds each. The head being small, they meshed. In spring they are plump, I said, 'Those fellows are all spawned,' when I saw the very different looking fish on the wharf the other day, taken in the traps. The shad here may spawn in Gaspereau brook and the head of Dover bay. I have got 15 or 20 shad close inshore, taking them in the drag seine for gaspereau and for June mackerel. The seine is 140 or 150 fathoms long. Often we get salmon too, generally one moving along by himself. This spring a 28 pound salmon was taken with fresh herring bait on a haddock trawl. We took three salmon this season, one 17 pounds weight; we gaffed it as it went by near the surface; one was got in the salmon net and the other was on a haddock trawl. Occasionally we get a very fat shad in the fall.

Inspector R. A. Chapman, at the Moncton sitting, referred to the occurrence of shad along the north shore of New Brunswick: "A few shad are in the Pokemouche and Tracadie rivers, he said, "and many in the Miramichi, also the Richibucto; but not the Buctouche or the Cocagne." Mr. P. H. Fryers, Moncton, said at the same sitting: "Large shad are taken in the Miramichi at the end of June and in July; but they are full of spawn and are poor and dry.....Externally they were a coarse grained looking fish."

The rivers of Prince Edward Island would seem to be favourable for the shad; but no important fishery has ever been established there. At times catches of several hundred pounds have been made. About 25 years ago the Dominion Inspector of Fisheries (Capt. J. Hunter Duvar) reported as follows:—

Seven hundred and fifty pounds weight of shad were taken in herring nets; partly in the fish-trap off Kildare, Prince county, and partly in the tidal rivers of Queens. It is only within the past three or four years that these fish have appeared on our coast, and only in small numbers. A few have been observed in the Hillsborough river, above Charlottetown, and have been taken as far up as Mount Stewart. If it be correct, as surmised, that shad do not breed further north than the middle United States, and that the supply in the Bay of Fundy is merely a migration northward from that source, it would most likely be in vain to look for them in quantity on the island coast.

Different Runs of Shad.

It must be noted that there are two very distinct runs of shad in the Bay of Fundy. First, large spring shad, which are seen first off Lorneville shore early in May, these schools being on their way to rivers, such as St. John, for spawning purposes, as proved by the fact that they are full of spawn, and are large breeding fish.

many of them weighing as much as 9 lbs. There can be no doubt that these are the schools which are found later up the St. John river and its tributaries. They ascend for a considerable distance, not only ascending the Kennebecasis, etc., but proceeding almost to the Grand Falls, as we have reliable information that in a recent season 250 shad were caught in one night below the canon of the Grand Falls in May or June. Some are still taken by means of nets, fifty rods long, 4¾ or 4⅝ inch mesh, such nets securing several hundreds each season below the lower basin. Nets set at the mouth of Salmon river a little lower down also get shad. Similar schools go up the Petitcodiac river, but more especially the Shubenacadie and Stewiacke rivers. The Annapolis and Nictaux rivers are also resorted to by these spawning fish. After spawning in fresh water these shad return to the sea, and on their way down are known as "come-backs" or "spent" shad. They come down very rapidly according to the evidence of fishermen. When the come-backs descend, as Mr. M. Stackhouse, Carleton, stated, "there is a big run all at once; they rush past." These descending schools are noted especially in St. John Harbour, but in this condition they are poor, emaciated and practically unfit for food. Indeed, as Mr. Andrew Harned, Carleton, said, "Spent come-backs are not fit to eat; they are sick, soft and spongy and unfit for food. They fall to pieces, yet people will eat them because they are large, and they will buy them." "As to come-backs," said Mr. Robert Evans, of Lorneville, "they go out into the deep water and very few are caught, just a few in the salmon nets, by the Lorneville fishermen."

Another Lorneville fisherman, Mr. J. Galbraith, confirmed this, saying, "An odd come-back or poor shad we take, and of large size; we also get racer salmon. The spring shad of St. John river have nothing to do with our fall shad here." Mr. James McPhee, Lorneville, stated that "poor shad come-backs are taken, not more than three or four in a year. They are taken by salmon nets four, eight or ten miles out." As to the condition of these fish, the statements just quoted are confirmed by Mr. James Paterson, a principal fish merchant in St. John, who said, "I would not handle or buy spawning shad, as they are not fit to eat." Further, Mr. Geo. Leaman, Truro, said:—

These big shad, 9 pounds weight are mother shad, and inside are of a bluish cast, not nice white flesh and fat like the shad caught in the bay. I handled them last spring and previously, a barrel now and then, while other dealers here handled three or four barrels from Stewiacke. Shortly after the gaspereau the last run of these shad came in. They are both sexes but the males are fewer. I distinguish them externally. I have weighed the spawn shad and found three pounds in a nine pound shad, in others I found two or two and a half pounds and so on. The ova are well developed like the smallest shot. In New York, the shad are three to five weeks ahead of here. Roe shad sell well, but they are like calving cattle, unhealthy. There should be a law prohibiting them. The bay shad are fat, plump and excellent.

The spring shad in the Stewiacke river, as Mr. E. H. McGregor said, are in a ripe spawning condition:—

This river was, 15 or 16 years ago, just full of shad. They were full of spawn, the spawning being May 10 to 20.

The inferiority of the river shad for food purposes was pointed out over fifty years ago by Dr. Moses H. Perley, who said:—

The shad which pass up the river in the spring, are spawning fish, of large size, heavy with roe, and very thin. As a matter of course, these fish have but little flavour as compared with the fat and luscious sea shad, taken in the autumn, and are scarcely worth salting. It is much to be regretted that the spring shad should be caught at all, they are of little value when taken, and their capture, by destroying the breeding fish, tends greatly to the injury of the valuable shad fishery, of the bay, which ought to be most carefully preserved and protected.

From the Fishing Gazette of June, 1906, we take the following.—"After spawning the fish hurry back to the ocean in a lean and emaciated state. They are at this time useless to the fishermen, being known as 'racers,' 'down-runners' and 'spent fish.'"

Secondly.—Summer shad, called by some fishermen, autumn shad, which occur generally distributed over the bay from the end of June to September, have been of commercial importance in years gone by. They are never found in fresh water, but frequent the open water of the bay, especially the muddy areas over the vast flats in the upper reaches of the Bay of Fundy and Chignecto bay. The bay fishing is exclusively for these summer shad, and it is of this fishing Mr. Geo. Lewis, Bass river, said: "Drift nets were used in the latter part of June—hardly ever was a spawn shad taken; we quit early in August and we never saw 'racers' or come-back shad."

An important witness in his evidence spoke of the summer shad fishery as follows:—

When he was fifteen years of age he lived in a district where the shad fishery was of very great importance, and most of the resident people took part in the taking of shad each summer. Roe shad appeared never to be taken, indeed he never knew a roe shad until he got it in New York served up at the hotels. Shad full of roe were really unknown to the bay fishermen along the Colchester county shore.

The weight of this fish ranges for 2½ to 5 lbs., and they are very plump, fat and in good condition. The absence of spawn clearly shows, in our opinion, that they are the same shad as the large spring shad, but are not full-grown or matured and have not yet spawned. As Mr. McLellan, K.C., Truro, said, "When I used to see bay shad long ago we never saw roe in them, the bay shad being caught in July. These large spawn shad do not differ, as far as I could see, from the bay shad, except in size."

Dr. Perley long ago pointed out the superior quality of the sea shad.

He says: "Of the sea shad, none are so fine as those taken at the head of the Bay of Fundy, in the muddy waters of which they attain the highest perfection, owing to the great abundance there of their favourite food, the shad-worm and the shrimp."

While Mr. Herbert (Frank Forrester) in his "Fish and Fishing," speaking of the Shad, says:—"This delicious and well-known fish, which is by many esteemed the queen of all fishes on the table," and adds, "the flesh of the shad is perhaps the most delicate of any existing fish."

The sea or summer shad is essentially a poor-man's fish, as it can be cooked in different ways, not requiring any dressing to make it palatable. How highly shad, when taken in the sea, are esteemed, may be judged from the expression of opinion

in a recent official report (Fisheries Report, 1907-8, p. 49): "Shad in good condition, caught in or near salt water is preferred to the salmon by many people."

The late Inspector Rogers, in the Department's report of 1887, page 82, expresses a view shared by a good many persons, that the river spring shad are not the parent fish of those caught in the bay and distinguished as summer shad, and he states that the latter are really fish native to the waters further south, that is, they are United States shad which have migrated north. Now, it appears to us from our investigations that this point is not well founded. The fact appears to us to be that the large shad come in from deep water to the various rivers of the Bay of Fundy to spawn early in the spring. According to the evidence of fishermen, these large shad keep to the deeper channels and thus escape the weirs along the shore, only an occasional one being caught in gaspereau nets ascending rivers such as the Shubenacadie.

Fishery Officer Davison, of Bass River, N.S., a practical fisherman of long experience, who addressed an important communication to the Commission, printed in full as Appendix 2, expresses his views on the point referred to above and the following extract may appropriately be given here:—

There are some men who no doubt have carefully thought over the matter (I would refer to the late W. H. Rogers, for example) who held the opinion strongly that the shad which ascend the Shubenacadie and Stewiacke rivers to spawn have no connection with the shad which supply our bay fishery, but were the products of shad which ascended the rivers far south and deposited their spawn early, then, later about the month of June arrived here fat; but he never ventured on an explanation as to what became of the spawn deposited in the Shubenacadie and Stewiacke rivers. Of course the fact of having fat shad so early after the spawning season seemed rather strange. Personally, I believe, that the shad caught in Cobequid bay during the months of June, July and August (that is the female shad) have not arrived at the age of motherhood for that year, but many of them no doubt will go up the rivers to spawn the following year and by so doing will propagate the species, while others will never live to ascend the river the second time. As to the theory that our shad go to the far south to spend the winter, I have strong doubts. I believe rather that our bay shad go far enough away to get into deep enough water to secure them a comfortable temperature in which to spend their winter. Other causes which might be mentioned are over-fishing, late fishing, &c.

Inspector H. E. Harrison, Fredericton, N.B., in his report, 1907-8, referred to this matter (p. 48). 'The most unpleasant feature about the returns is the decreasing catch of shad from year to year. Some fishermen tell us that they believe shad are moving to some other waters; that they do not come to the Bay of Fundy and tributary waters as plentifully as formerly. True it certainly is they do not come this way as formerly, but I do not think they are going anywhere else. I believe it can be charged to overfishing and I trust the forthcoming inquiry by those entrusted to make it, will be a means of having matters arranged so that shad will have a better chance to propagate, and still give fishermen fair treatment.'

In former times, when shad were plentiful in the bay, vast schools of young were very frequently seen. These shad, 1½ inches to 2½ inches in length, one witness said, were abundant in the Petitcodiac river about July 1. One witness stated that off East Noel shore:—

The weir took any amount of small fish, smelt and gaspereau and eels. Also small shad 1 inch to 4 or 6 inches long in July, but none before June 20; they were bright silvery fish, either shad or gaspereau. Alewives also occurred with them. We don't get these small fish in the nets.

While another witness, on the Colchester shore, stated, 'I have seen small shad about the middle of August in big schools in a weir. They were 2 inches or even smaller. None have been seen by me for a long time.' A similar statement was made by a witness at Great Village:

As to the migrations of shad, &c., we often scooped up little fish two or four inches long in millions after the run of shad was almost over. I have seen a weir at Bass river in which multitudes of these small fish were killed, when I hired with Fulton, long ago. The sweep net swept these little fish on to the beach. Most of them went out as the water went out. They were young Shubenacadie fry coming down in August or September.

Moreover, in the stake seine in Scott's bay, the evidence showed that shad were taken as small as 6 to 8 inches in length. Such small immature fish are, it is clear, only a few months old, the larger probably approaching a year in age.

These small shad, in our opinion, become in the course of their growth what are called summer shad.

The fact that shad of various sizes and ages, as described above, frequent the waters of the bay about the same time during the season, clearly shows that these fish are native to our own waters and have not migrated from southern United States waters. As the *Fishing Gazette*, N.Y., said not long ago: 'The little shad remain in the river until the fall, when they too take to the ocean. It has been proven that they return in subsequent years to spawn in the waters of their infancy.'

It is important to notice that the small, immature shad referred to were taken in weirs and stake seines, but not in drift nets or gill nets, through the meshes of which these small shad readily pass.

Methods of Capture.

There are at least six methods adopted in the taking of shad by the fishermen. By all these methods the fish are either, on the one hand, inclosed or entrapped, or, on the other hand, meshed or gilled, according to the type of apparatus used in the different localities:—

(*a*) *Drift nets,* or gill nets, have been used over a very wide area, viz., St. Mary's bay, Annapolis basin, Minas basin (on the Avon river) and Cobequid bay, also Cumberland bay, Chignecto bay, including the Petitcodiac river, St. John river and its tributaries and finally the shore of St. John county from St. John harbour to Point Lepreau.

Thes nets are mostly constructed of linen twine, while when first used they were constructed of cotton twine. The twine in some cases is very fine, in some places No. 22 linen being used and in other places Nos. 18 and 20, while in other localities the nets used are made of 3-thread mackerel twine, or are Scotch nets bought already knitted. The length of gill nets ranges from 200 fathoms to 600 or 700 fathoms, that is, twelve or fifteen bunches to twenty-five or thirty bunches, but in the salt water, in the mouths of rivers, shorter nets are frequently used, as short a length as 30 or 40 fathoms. The depth of the net ranges from 42 to 56 or 60 meshes, the mesh being

as small as 4½ inches in some cases, though 4⅝ inches and even 5 inches is the size of mesh in more general use. Wooden floats are attached along the top line and lead sinkers are attached along the bottom line. Formerly the nets were dyed by being soaked in a liquid made with hackmatack bark, but the fishermen have now universally adopted a new method, viz., soaking the nets in raw linseed oil, the best quality of English linseed oil being used. After being soaked, the nets are hung out and dried thoroughly before being attached to the rope. A fisherman on the Kennebecasis described the nets used up that tributary of the St. John river:

I did not get a thousand shad this year and the total catch in the Kennebecasis would be 10,000. Up above, big catches were made this year, clear to Norton, a total of forty people probably fishing. Mr. Drew fished only a short time and only got 200 shad, but down at the harbour a great many more than we get are taken. Not much can be done in the wide river below, possibly not more than 500 shad taken between here and St. John. The nets we use are cotton gaspereau net cut into two and making eight lengths 18 meshes deep. The net is thus 18 fathoms or 60 yards long of 3⅝-inch mesh. Shad nets are 4⅞ inches, 40 meshes or 12 feet deep and 75 yards long with a float rope along the top and sinkers along the bottom. In spring when we use these nets the water is high.

(*b*) *Set Nets.*—These nets, like the drift nets, gill or mesh the fish, but instead of drifting with the tide they are fixed upon stakes which are driven into the mud. These stakes vary in length, usually about 20 feet long and 30 or 40 feet apart. The twine used is No. 18 to No. 20, and the mesh about 5½ inches, though 4½ inches or 5 inches is in general use. The larger mesh, some of the witnesses stated, secure the fish more effectively, as they are better meshed. The net is 13 to 18 feet in depth and as a rule dry at low water The cost of the net varies, but a fisherman may have $70 or $80 invested in his set net. These nets were formerly used all around the Bay of Fundy shore but have largely gone out of use in recent years. Drift netting has been more generally adopted by the men who formerly fished set nets, and has proved more efficient and successful.

(*c*) *Seines.*—Seines, as used in shad fishing, are really fixed nets set on stakes, and are intended to inclose or impound the fish. These nets are often of great extent, some reaching a length of three-quarters of a mile. The net is four feet high and attached to long stakes, frequently forming a V-shaped inclosure with a bunt or trap of No. 18 cotton thread, the mesh being 2 inches, and an inside net 5-inch mesh, is placed inside the bunt. A small seine, 3,000 feet long would, as stated by witnesses, cost about $200, but a large stake seine may cost as much as $1,200. William Steele, of Scotts Bay, said that the seine there took 18 to 19 men two weeks' labour fixing up, and cost probably $800 or $900. Some of these stake seines appear to have been of extraordinary length; one at Boot island, below Windsor, N.S., was two miles long; and Dr. Perley speaks of one at Noel, in 1851, which was between two and three miles miles in length.* Stake seines are mainly fished off Kings county shore, Nova Scotia, in the estuary of the Avon, Scotts bay, &c.

(*d*) *Brush Weirs.*—With the exception of the primitive methods of taking shad by pitchforks and spears, the brush weir is one of the earliest methods adopted for taking shad. The weir varies in shape, according to the locality in which it is built.

* Dr. Perley in his work already quoted (p. 151) refers to the injurious effects of such nets.

Some are left high and dry when the water ebbs, and the catches of fish left in the weir must perish. Others are always partly under water and the surplus fish can be liberated when necessary, especially if, as in some cases, a gate or door is provided. The weir consists, essentially, of a wall or lead built of stakes driven into the mud or sand, over which is woven small brush or twigs, usually white birch, and terminating in a chamber of the same material, which is planned to prevent the escape of the fish when once inclosed. Some are very simple in form and others more elaborate. A large weir such as that at Old Point, near East Noel, as described by one witness, was a mile long, ten feet high in the highest point and it took two weeks to build. Sixteen fishermen had shares in it, and it is stated to have taken vast quantities of fish of all sizes, as of course every kind of fish finds its entrance into a weir.

(*e*) *Spring Nets.*—These nets are used in a few places, such as Annapolis and Gaspereau rivers. They consist of a chamber of net about 12 feet square, secured to stakes, with a long pole like a lever for raising it out of the water. A diagonal wall of stones, about 18 inches high, is built across the stream or river, and forms a lead, up which the fish are turned to reach the chamber or trap. At the upper end of the lead is a transverse wall of brush three or four feet high. In the angle formed by this brush wall and the stone lead, the net is sunk near the bank of the stream, where a wooden platform is built, overhanging the water. The fisherman stands on the platform and raises the net by means of the pole described, the fish being lifted up and secured.

(*f*) *Drag Seines,* or *Sweep Seines.*—These nets were formerly used by settlers for taking shad, and it is on record that large catches were at one time made. "I helped to take 10,000 shad at one haul at Scotts bay in a 15-rod sweep seine," said one witness. But fortunately this very destructive form of net has gone out of use altogether.

(*g*) *Dip Nets.*—In certain places, dip nets for shad were used in early days, and when the shad were extremely abundant it was possible to make sufficient catches for home use. The dip net was used from an overhanging platform, similar to that used in the case of the spring net, and the fishermen stood beside the bank of the river and dipped out the shad as they ascended rivers and streams.

Habits and Food of Shad.

Schools of large shad come in-shore in the spring from deep water, and in the Bay of Fundy are first seen off the Lorneville shore. They move rapidly towards the rivers, which they ascend to spawn. "The spring shad pass along our coast to reach St. John river," said one witness at Lorneville, "and," he added, "those passing here go pretty quickly, so that two weeks covers our fishing." In the opinion of some of the witnesses, these fish swim at the surface, one testifying that the spring shad "are fished at the surface of the sea," and on reaching the mouth of the river, to which they go to spawn, they seem to keep to the deeper channels or "current water," and for that reason do not seem to be taken in any numbers by weirs, &c., such as are located in St. John harbour. They do not mesh in gaspereau nets as they pass up, one Shubenacadie witness stating, "For two or three years we have never got a shad in our gaspereau nets." As already pointed out, these spring shad return to salt water without delay after spawning, not having apparently taken any food in fresh

water, as their poor condition demonstrates. They go to deep water, out at sea, to recuperate. As one fisherman said, "Come-backs go out into deep water and very few are caught after leaving the river, just a few with the salmon in salmon nets." A St. John witness declared that these come-backs go out very rapidly, there is a big run all at once, they rush past, 200 or 100, at high water at dusk, i.e., at slack water.

The schools of summer shad, which have heretofore formed the principal fishing of the bay, come in about the last of June, and their habits seem to slightly differ from the habits of the large spawning schools. The summer shad invariably avoid entering the fresh water and do not pass into rivers or streams. They seem to be mainly occupied in feeding. Many authorities hold that they feed on shad worms on the muddy flats, others that the food is mainly a kind of brown bug with numerous legs, usually called shad feed. Others hold that the food is principally small vegetable matter; but the subject is one for scientific investigation. Whatever the precise food is, the shad fatten amazingly upon it, and those caught at the close of the season are in the best condition.

Spawning Grounds.

ST. JOHN AND TRIBUTARIES.

Dr. M. H. Perley in his account of the fisheries of New Brunswick furnishes some details as to the spawning resorts of the St. John river shad as they were known, "the shad which ascend the St. John river for spawning to Dowlings lake, Kennebecasis, Douglas lake, Nerepis, the Washadamoak lake, the Oenabog, the Grand lake and the Oromocto river. They are caught in the St. John near Fredericton but not often as the water is too rapid. The shad taken in the fresh water are very inferior to those which remain exclusively in the salt water of the bay, and the longer they are in the river the more worthless they become." Dr. Perley's views are confirmed by subsequent authorities and by the evidence recently taken before this Commission. For example, Mr. E. D. Prince, Kennebecasis, said:—

The shad go up quickly so that one day we see them five miles below and next day they are up at Norton. Late one year when there was high water, after rain, I saw many shad running round each other, no doubt engaged in spawning. Shad are quick in going back after spawning. The farmers just fish for their own use and no big catches are made. We don't set our nets square across, don't want to, but we let the the nets go down as the tide ebbs and as it turns we get fish and take out the nets as the tide runs up. The fish stay only a few days. A few shad go up above Percy Point and then go away above Norton.

The same witness referred to the schools of fry hatched undoubtedly on the Norton and adjacent spawning grounds:—

I see small shad in Darlings lake in October; millions are there now two or three inches long. They swim on the top of the water and look exactly like little shad or gaspereau. They may be schools of young that have lost their way but most have gone down. There are more in spring, the water being full of them. The other day (Monday) was a still day and we saw a school 10 feet wide so thick that we could catch them easily with our hands from the gasolene launch. It was quite a surprise to me.

AVON RIVER.

The run of fish in this river must always have been limited because of the natural obstructions three miles above Windsor. As Inspector Rogers said in his official report, 1868, "I conclude that the drift nets in the Avon are as destructive as the dam across the river. These nets are from 150 to 300 fathoms in length, and so effectively close up the river that it is almost impossible for a single fish to escape."

ANNAPOLIS RIVER.

Important evidence was given on the spawning grounds of the Annapolis river and its tributaries, and of this evidence the following may be here quoted:—

In the Annapolis river there is a shad spawning ground 2½ miles above Middleton. On May 24 I saw a school of spawning shad in a nook where the river used to run, it was five feet deep and very clear with a fine growth of weeds. The bottom was gravel and their backs were out of the water. There must have been four barrels of them. They were so thick they rocked our canoe with their backs. Above that they spawn in the main river, but it is filled up with gravel washed out from the bank.

In 1869, it may be added, shad were reported by the local warden to occur at Palmer's meadow, forty-three miles above Annapolis and twenty-two miles above tide water.

PETITCODIAC RIVER.

As to the occurrence of spawning shad in this river, one witness, Mr. F. L. Dobson, said spawning shad were got at the tail of Holmes mill, on the Petitcodiac river, while Mr. J. A. Steeves, Coverdale, said, "The best idea is to protect the spawning fish above the head of tide. I never knew shad to come here until two or three years ago. It is not more than three or four years ago I heard of them in numbers going up with the tide, and they are caught in greatest numbers four or five miles above Salisbury, near Colliers bridge, where there is a reach of river, about a mile of clean gravel bottom and no mud, known by the name of Intervale river." It may be added that several barrels of shad were shipped from the part of the river referred to in the spring of 1908. Important additional testimony on this point was given by Mr. G. Jones, who said, in reference to the clean spawning grounds mentioned, that 'the water was solid with fish. I have known that shad came there for a long time, but they are less numerous than when I was a boy. About the last of June I have seen vast numbers of young shad." The testimony as to the occurrences of spawning shad in this river appears somewhat conflicting, most of the fishermen inclining to the view that shad did not ascend this river for spawning purposes until recent years, while, on the other hand, there are parties who take the view that shad have always gone up this river but were not observed and were not taken during the fishing operations carried on, which were of a limited character.

STEWIACKE RIVER.

This river, which is a branch of the Shubenacadie river, was, according to the testimony of Fishery Officer McGregor, full of spawning shad fifteen or sixteen years ago, the schools of fish ascending the river early in May and the spawning period extending from about May 10th to the 20th each year. Confirmation of this testimony was afforded by other witnesses, including Mr. D. H. Goodwin, who said that 35 years ago shad were very plentiful in the river—quantities of shad coming

down in a spent condition were observed, that is, fish having been up the river and spawned. They ascended to a point 5 miles above Stewiacke town. It was stated that Robert Bates caught 30 in 1908, and two years ago the same party had secured 80 in one night. Three years before, viz., 1905, large catches had been made, a total of at least 500 being taken, and one man caught no less than 230 of these shad.

SHUBENACADIE RIVER.

That this river was a spawning resort for shad was recognized over 60 years ago. Dr. Perley, in reference to this point said (p. 157 of his Report on Bay of Fundy Fisheries, 1851): 'The shad fishery is carried on to the eastward of Windsor, partly by drifting, but chiefly by stake-nets, on the widespread flats in front of Cheverie; thence the fishing is continued to the Shubenacadie river, up which the spring shad ascend to the Shubenacadie lakes, for the purpose of spawning.'

A practical fisherman at the Shubenacadie sittings of the Commission said:—

The shad go up the river to spawn and for no other purpose, and I have always thought that the decrease down the bay below was due to the taking of these spawning shad. Sawdust does harm to shad and the river is more full of it than ever before. I'd like to see shad plenty again.

The witness continued, saying:—

He had fished for some years shad, gaspereau and salmon. He fished just at one place near the town. The gaspereau appear about the middle of April; the 13th is the earliest and they last to the end of June. They ascend by spurts, some day a lot, and then none, the later runs are not so good. There are two kinds, mulheaden or blackbellies and alewives or gaspereau, the former being dark inside, and Maitland people think they are a cross between herring and gaspereau, they run last. Two weeks after the gaspereau, come the shad. Occasionally the gaspereau nets take a shad, but the mesh is too small to take many. A stray bay shad, a shorter, fatter fish, is taken especially if a salmon net is set. Our large shad run nine pounds weight; all are spawn shad and occasionally all run large. I have caught them coming back, a few 'spent' ones, but they are no good, they are poor and thin and so weak that eels chase and take them.

Another witness said that the river was the natural spawning ground for these fish. He said:—

It has always been considered that this is the natural spawning ground for shad for the bay. It has always been considered that all the fish that come up the river are fish from the Bay of Fundy; the opinion of old residents for thirty, nay for fifty years, is to that effect.

Another Shubenacadie fisherman of fourteen years' experience said that shad came up in April, but that

Shad are a week later than gaspereau, say the last of April, or if gaspereau are about the 10th to the 20th of April the shad are a week after that. The shad are big, 'whoppers,' all females, indeed I don't remember a male at all. They are swollen with roe, two organs at the sides. I used to fish with a salmon net for shad five inches, shrunk to five inches. Our catches would be fifty in a night, often three to five only. The first run were the biggest and were going up to spawn, but some had spawned or were without spawn. I never kept record of the season's catch. After the shad the salmon ascend. As to small shad I saw them three inches long go down in the fall, the big freshets at that time left them on the banks.

Further up the river, at Elmsdale, the evidence proved conclusively how important the gravel areas in the Shubenacadie were as shad breeding areas. This river is the natural spawning ground of shad, as one resident said:—

Shad can be seen still and not moving in the daytime. I have caught them mostly head down stream as if they came up and played down. They were for my own use, but we sold a few and corned some. The females had spawn but a good many were males, and were smaller, fatter and better eating. Usually there were more females than males. At high tides they run up males and females mixed. After a few days there would be none and later another run. Two or three runs occur. They began about May 1 and I got seven or eight in the morning. They stop them down below us and it is unfair to us above. I don't notice the spawning schools so much now because the fish are scarce. The water was alive with spawning fish when they used to be plentiful. They say the fish scoot round in the water and play so that they can't be netted. They won't go into the net. Some think they spawn in the lake but none are got there, and they spawn in the river, especially a crooked place called the Oxbow or Carsons land, a muddy grassy place with gravelly spots. This river is undoubtedly their natural spawning ground.

One of the most experienced fishermen on the upper Shubenacadie waters informed the Commission that:—

The shad were very plentiful about 1893, and a net set would take 75, 100 or 120 in a night for a season or two, but they slacked off quickly because of sawdust pollution and eels. In the spring of 1905-6, one man here got thirty or forty, they had decreased so much. Old people say that shad come back to the same spots. The spawning grounds are not below Sandy McDonalds, Barneys Brook, because tide comes up there and the bottom is mud—they choose a good clean bottom. They spawn at Enfield and come down looking long and lanky. The Shubenacadie and Nine Mile rivers are their natural spawning rivers, and they should have been used better.

Undoubtedly the taking of quantities of shad in this river must have had a depleting effect. In early days the taking of these spawning shad was limited and merely for local domestic use; but as it assumed the character of a commercial enterprise to supply such markets as those of Halifax and Truro, the effect of more extensive fishing has been correspondingly disastrous.

Causes of Decline.

DESTRUCTION OF SPAWNING SHAD.

We have in the preceding part of this report referred to the extensive destruction of spawning shad up the various rivers tributary to the Bay of Fundy, and we feel compelled to place this cause at the head of the harmful causes which have been most disastrous of all in bringing about the decline of the shad industry. In the St. John river this serious matter was referred to long ago by Dr. M. H. Perley, who in 1852, claimed that the 'spring shad should not be caught at all, they are of little value when taken, and their capture, by destroying the breeding fish, tends greatly to the injury of the valuable shad fishery of the bay, which ought to be most carefully preserved and protected.' The same authority declared that 'the shad which pass up the river in the spring are spawning fish of large size, heavy with roe and very thin. As a matter of course these fish have but little flavour as compared with the fat and luscious sea shad taken in the autumn and they are scarcely worth salting. The chief shad fishery is that for sea shad taken outside St. John harbour by drifting

during the night. Shad so taken, although of very fair quality, are, however, inferior to those caught at the head of the bay.' Most parties acquainted with the history of the bay shad fisheries agree with the authority mentioned, in the view that this destruction would do more than anything else to bring about that total depletion of these fish which now confronts us.

The destruction of spawn shad ruins the industry at its fountain head, and if hatcheries, as many parties hold, could make up for this destruction the difficulty would be to obtain an ample supply of spawning fish, the spawning fish would be lacking, so that hatching operations could not be carried on. One of the principal authorities in the United States laid great stress on this, and in an interesting statement, published in 1906 and dated May 29, Washington, D.C., he says:—

The shad fisheries of the Atlantic coast are doomed unless the States take immediate steps to protect them from the rapacity of the fishermen, is the opinion held by John W. Titcomb, in charge of the hatching service of the United States Fish Commission.

The great demand for shad roe prevents natural spawning and perpetuation of the species. The bureau is now closing the hatching and distribution of shad for this year, and reports from various stations give startling evidence that the supply of shad on the Atlantic seaboard is rapidly diminishing. Facilities of the bureau allow the hatching and setting free on the streams of the country of 300,000,000 shad fry annually, but this year only about 45,000,000 have been handled. The output was 65,493,000 in 1904, and last year it was below 57,000,000.

Mr. Titcomb predicts that in ten years, without the intervention of state protective laws, shad will become so scarce in the Atlantic rivers that they will be purchasable only by the stewards of big hotels and those who supply the tables of the very wealthy.

Habits of the shad lend themselves admirably to the extermination of the fish. They approach the shores in immense schools, actually crowding one another in their efforts to reach the head of the fresh water streams, where the spawn is deposited. The fishermen have learned how to intercept the run by nets in the bays and in the broad mouths of the rivers, and the marketable shad are now nearly all caught in this way.

Few roe shad escape the nets. The rivers are thus much depleted, the natural spawning of the fish interefered with and the supply of eggs available for the hatching bureau cut off.

In pointing out a remedy Mr. Titcomb says it is incumbent on the States to enact restricting laws against the taking of fish in the brackish waters of the bays and at the mouths of the rivers. He believes the fish should be allowed to ascend the rivers unmolested, at least during one of the annual runs, possibly that in May, and during a considerable part of the shad season the catch should be limited to fresh water.

Streams on the Pacific coast have been stocked and the shad transplanted from its native waters in the Atlantic ocean to the Pacific with good results. Shad are increasing in California and other western rivers under the restrictive laws there enforced.

Our visits to the various rivers and the evidence which we obtained at our different sittings compels us to conclude in regard to this matter that nothing has contributed so much to the depletion of the shad fishery as the destruction of the spawning fish up the rivers, especially since this capture of the breeding fish has been carried on for commercial purposes. The small catches made formerly by settlers were such as sufficed for their own home use and a commercial fishery for spawn fish was not engaged in to any extent until 20 or 25 years ago, when, notably in the Shubenacadie and Stewiacke rivers, this destruction of spawn shad assumed

serious dimensions. This commercial fishery up the rivers referred to became quite a considerable industry and its growth may be judged from the figures given by Officer J. W. Davidson, from the returns of the local officer as given below:—

When shad fishing was at its best, the number of shad caught in my district was from 3,000 to 5,000 barrels. The following shows the number of barrels of shad taken in my district between the years 1889 and 1906, inclusive:—

1899	1,107	barrels.
1900	1,303	"
1901	269	"
1902	97	"
1903	314	"
1904	38	"
1905	30	"
1906	24	"

With reference to the cause of such a complete failure of the shad fishery, the first and greatest reason is, I believe, the destruction of the mother shad in the rivers when they are ascending to their spawning ground. These shad, which go up our rivers to spawn, furnish the supply for our bay fishery and if the mother shad are destroyed the natural result is that the supply for the bay is cut off. To prove that a great many shad are taken in our rivers I will give the numbers of barrels reported by the overseer to have been taken in the Stewiacke river between the years 1899 and 1906:—

1899	500	barrels.
1900	700	"
1901	600	"
1902	176	"
1903	810	"
1904	1,000	"
1905	400	"
1906	25	"

The above report would appear to indicate that not only has the taking of these spawn shad cut off the bay supply, but that the destruction of life has been so great as to have destroyed the mother shad almost entirely.*

Inspector Robert Hockin, Pictou, Nova Scotia, has for years urged that effective measures be carried out to save the shad fishery, and in numerous reports has fully stated his views. For example, so long ago as 1896 (Dept's. Fishery Report, 1896, Appendix No. 3, p. 50) he said of the shad: 'This is peculiarly a Bay of Fundy fishery, only a few barrels are taken in the other waters. They are caught mostly in the drift nets and weirs. The catch, in excess of that of last year was 19 per cent and compared with other years is as follows:—

1889	535	barrels.
1890	750	"
1891	1,178	"
1892	1,811	"
1893	746	"
1894	981	"
1895	1,185	"

In the years 1878-79-80, the returns from the same locality gave an average catch of 6,918 barrels.

To restore this fish to something like its former proportions, would mean about $50,000 per annum gained to the fishermen over this limited area. There appears to

*The table giving the figures for Stewiacke river, no doubt refers to green fish i.e fresh shad, whereas the preceding figures may possibly include both salt and fresh shad.

be a reasonable probability that the 120 barrels of gravid fish annually caught in the Shubenacadie river, affords indication where remedial legislation would be followed by most valuable results.'

OBSTRUCTIONS ON RIVERS BY DAMS, ETC.

There is no doubt that one of the most serious causes of depletion has been the blocking of rivers by dams which prevent the ascent of the spawning schools of shad. This was years ago established in the Penobscot shad fishery. In that river in the State of Maine shad were extremely abundant, but about thirty years ago a dam was erected which resulted in almost exterminating the shad fishery there. In many of the rivers flowing into the Bay of Fundy the erection of dams has had extremely harmful results, some of these obstructions being of a formidable character. One of the most serious cases observed by the Commission, on the occasions of its visits to these waters, was the large dam on Salmon river, Colchester county. Other obstructions which have had a detrimental effect are log jams, which undoubtedly deter the ascending schools from reaching the upper waters; while the use of set nets which, it is alleged, are often stretched completely across streams, has done much to prevent the fish reaching their spawning grounds.

Mr. C. A. Stevenson, in his famous report to the United States Fisheries Bureau on the shad fisheries, laid stress on the damage due to such obstructions and states that:—

An examination of thirty-three of the principal Atlantic coast rivers, aggregating 7,391 miles in length, shows that shad formerly existed throughout 5,330 miles, or *72 per cent of the length*, and that at present they are to be found in only 3,635 miles, a decrease of 1,700 miles. This includes the principal rivers, and if the minor streams and tributaries were included, the total length of which shad have been excluded would doubtless appear more than twice as great. In much of that length shad were quite numerous, the catch in many instances exceeded the yield in the portions to which the fisheries are now confined.

The limitation in the range of shad in the rivers is the result of several agencies, in addition to the size of the stream, the most important of which are (1) natural falls, (2) insurmountable dams, (3) pollution of the water and extensive fisheries.

Natural falls exist at the escarpment line in all the rivers having their sources above the costal plane, but in only a few instances are they of sufficient height to form insurmountable obstacles to the range of shad. But most of the streams have been made impassable at or a short distance above the escarpment line by means of artificial dams for developing water power or for navigation improvements.

OVERFISHING.

At quite a number of sittings the evidence showed that overfishing had been carried on and numerous catches made, especially in former years, involving not only excessive destruction but in many cases an actual waste of fish. Had some restrictions been placed years ago limiting the amount of gear used and guarding against excessive catches of fish, a chief cause of depletion would have been averted. Such large catches were made that it frequently happened the fishermen could not handle them. In Scotts bay, in 1842 the Commission had testimony that on one tide no less than 50,000 shad were taken in a stake seine. 'In 1872-73 a very large catch of shad was taken at Scotts bay in three seines, no less than 100,000 shad being captured. In 1884 55,000 shad were captured in the same apparatus, and in

1897 a catch of 45,000 shad is recorded. Such big catches could not fail to have an extremely harmful and widespread result. Indeed one witness said that when such big hauls were made "the shadmen could not take care of their big catches and had to let some go adrift." In 1865-68 I have known 3,000 to 4,000 taken at a time, but 8,000 to 10,000 was more usual, and never more than three or four spawners taken at such times. Shad have declined gradually, although there are not so many weirs for shad as there used to be.' Officer Adolphus Bishop in his evidence declared to the Commission that overfishing must be blamed as a principal cause of decline, and recently Inspector Harrison in his official report, 1907-8, likewise laid stress on overfishing as the cause of scarcity. He reports:—'It is with great regret the fishermen, as well as all classes of our people, find these excellent table fish becoming scarcer from year to year. I think the real explanation is overfishing, and fishermen along the St. John and Washedamoak rivers, at least, realize the necessity for action of some kind at once and are quite willing that greater restriction be placed on the taking of them.'

R. W. Starr, of Wolfeville, gave interesting evidence respecting the decline of the shad on Cornwallis river. He informed the Commission that:—

A stake net 300 or 400 yards long was thrown across False channel below the junction with Shad creek. This was very successful, and for several years the net was added to, then it was moved further down to Clan creek for two or three years with varying success. Moved to the flats of Canard river north of Stars point, it was enlarged and very successful in its new position. Another company took the old ground on Clan creek with fair success for several years. These nets were fished every tide from the shore by flat punts drawn by a horse. Another seine on a middle ground near the channel of Cornwallis river was also fished by boats. In 1861 the Starrs put in a large stake net on the point of flats between Canard and Cornwallis rivers. It was 10 feet deep and nearly one mile long, and for eight or ten years was very successful. Meantime the other stands began to fail and be abandoned, and ours declined and other business pressing, we sold our rights and net to another company who have continued the fishery to this day. During this time drift nets took large quantities of shad. The men went out with the tide and returned on the flood. No question, over-fishing had much to do with the decline.

SAWDUST AND OTHER POLLUTIONS.

The injurious effect of sawdust pollution have long been regarded as of the gravest moment in regard to the shad fisheries. Fifty years ago Dr. Perley called attention to the prevalent pollution of the Bay of Fundy rivers by sawdust and mill refuse, and he expressed the view that great harm must result therefrom to the fisheries if this pollution continued. He said: 'There can be no doubt that the large quantities of sawdust and rubbish from the sawmills which have been cast into the harbour of St. John of late years have been highly detrimental to the fisheries and most injurious to the harbour itself. The great floods of St. John, occasioned by the melting of the snow and ice at the close of winter or by heavy rains at other periods, bring down large quantities of fine silt, rendering the water at those periods extremely turbid. This alluvial matter encounters the sawdust in the harbour and jointly they form a deposit which soon attains much solidity wherever it happens to rest. The western channel into the harbour has shoaled very considerably as well from the deposit of silt and sawdust as the aggregation of slabs

and edgings also sunk there.' Quantities of sawdust, before becoming water-logged and later sinking to the bottom, cover the sandy beds and fill the pools which the shad frequent. When the sawdust rots it must in its decayed condition be most deadly to all insect life and to the minute food upon which the shad fatten. One witness, at Great Village, said:—

Dirt and sawdust are both bad, I have seen sawdust in the gills of a shad. Three or four sawmills on each river pouring their sawdust into the bay all along this shore is most harmful. The 'Nest' is an eddy caused by a reef and sawdust settles there. On the flats it is two to four inches deep and the fish which used to stay don't come now to feed there where there was little current and they have now left it altogether.

The view has been strongly expressed by certain fishermen, especially on the Petitcodiac waters, that the shad swallow sawdust where the water is polluted with that waste material and that examination of their stomachs showed that they were not only full of sawdust but that it had decayed and had caused swelling, distending the walls of the stomach, which became thin and diseased. The shad themselves were as a result in very poor condition—red inside and sickly—and resembled spawn shad and must have been quite unfit for food. It is the conclusion of the fishermen that sawdust must cause the death of the shad. The effect of sawdust, in the opinion of fishermen and others, would appear to be that it chokes the fish, it causes them to decay when they swallow it, it deters fish from ascending, it drives them away and, especially if deposited on spawning beds and on feeding grounds, must be most harmful.

Curing and Marketing Shad.

In the early history of the fishery the shad were taken by such simple means as pitchforks, spears and short nets, as already described, and the fish so taken were used for home consumption in both a fresh and salted state. Shad, so far as can be ascertained, were salted in barrels in the early 'forties' for export to the United States' markets. One of the pioneers in this industry was Mr. Halliday, who had come out from Scotland and carried on business in Halifax and came to the Bay of Fundy with a vessel and several boats, about 1840, to engage in the shad industry. As one witness said:—

Mr. Halliday sent his fish to the Boston market. He put up No. 2 shad, splitting them and leaving the head, backbone and tail on them. The No. 1 shad he put up with the backbone in them. The year I was with him he began to dress them by taking the head off, taking out the backbone with the tail selling them as No. 1 'mess shad.' I think I was the first man on the bay to split shad in that way. From 102 to 105 of these No. 1's shad without head and bones would fill a barrel of 200 pounds. I think shad brought from $16 to $18 per barrel in Boston.

In due course the fishing industry grew in extent in the bay waters and the large markets were supplied with salt shad, these markets including Boston, New York and Philadelphia.

Various methods were adopted in different localities in the modes of putting up cured shad, as will be detailed shortly. So long as the supply of shad continued abundant the export business was conducted on a large scale but in course of time the fish fell off in quantity and the export shipments consequently ceased and the local markets then practically took all the catch. Indeed, the local demands in

recent years have been far greater than the supply. Were the fish now obtainable in the large quantities recorded in former years, an enormous business could be rapidly developed, especially on account of the increased transportation facilities and the readiness with which shipments of shad could be sent in refrigerator cars to the large centres of population in the west. Respecting the modes of preparing shad and curing them, the earliest method was to cut off the head and split them down the back, as one witness described was the method adopted in St. Marys bay, Nova Scotia. This witness said:—

Our method of preparing shad was to cut off the head, and split the back (some split the belly) and take out the bone as far as the entrails. Then the fish was washed and scraped to get the blood away, then washed twice and placed in a tub or cask and allowed to soak in brine four hours or more. The tail remained on. They must be salted heavy. We took out the bones as they are difficult to cure with the backbone in. The men at St. John, N.B., split the back and left the backbone in, both the men of Colchester, Economy, &c., split shad up the belly. Clean salt water is the best to dress them in and for 'striking' Liverpool salt is best (in bags).

Further up the Nova Scotia shore, at Scotts Bay, a somewhat different method was adopted "We split them in the back for salting," one witness testified "scrape the blood out and scrape off the scales before salting. The Scotts Bay fish had indeed a superior repute, because the shad were scaled. The scales were taken off before they were salted and the head was removed." The fishermen, along the Tenecape shore did not remove the scales, but the following method was adopted in curing shad. As an experienced fisherman said:

Our method of curing is to split them in the belly and take out the backbone and sliver the tail off. We keep the scales on to keep in the fat. Soak them three hours and salt, using a lot of salt the first time or they will spoil. Cover them with salt or where they touch will turn black and they will stick together.

Along the opposite (Economy) shore, a similar method was adopted as at Tenecape, and the shad acquired a wide reputation and were known as "Economy Mess Shad."

Up the Cumberland bay the Commission learned that from early times the shad were handled in a different manner, the head being removed, the fish split open down the back, the entrails removed and a slit made alongside the backbone to allow the blood to escape, this slit being in the thick part of the fish. In later years, the men in this locality adopted the method of leaving the head on, one fisherman describing the process to the Commission as follows:

'In curing we used to take the head off, but now the head backbone and tail are left on, formerly the shad were split, the backbone and tail left in, but the head taken off and then were struck down. When the backbone was taken out it was a 'mess shad.'

We cannot refrain from expressing the opinion that the lack of uniformity in cleaning, curing and packing salt shad has been a disadvantage in many ways. It is a disadvantage to the producer, the fishermen, and the merchant or dealer. The removal of the head, backbone and tail is a positive detriment to the fish, and the practice adopted in some localities of removing the scales before salting shad is not only unnecessary but in no way improves the quality of the fish, indeed much of the

flavour and the fatty matter of the fish is lost by this method. Shad, in our opinion, should be cleaned and cured as soon as possible after being taken from the water, and when this is done they retain their flavour and best qualities, and indeed are improved in every way. Moreover, the shad washed in salt water, it is claimed, retain a superior flavour and are better cured, than when fresh water is used.

Of course, the chief demand in recent times has been for fresh shad, the supply of which could not meet the demand, and if the restoration of this esteemed fish is accomplished by proper methods of protection and replenishment, the development of a great industry in the future is assured, as there is ample demand for all the supply of shad, both fresh and salt, that can possibly be sent to the markets. The recent increased demand for roe shad is a menace to the industry, and, as pointed out in other parts of this report, the table qualities of roe shad are far inferior to those of the fat summer, or fall shad.

Prices of Shad.

In early days, the catches of shad were so large that it was no uncommon thing for the fishermen to dispose of quantities at a nominal price, or even give them away to neighbours. In any case, the prices were so low that the very poorest could obtain their winter's supply of shad without difficulty. They were sold in a fresh condition locally at from 3½ to 5 cents each; whereas now they bring from 25 to 40 cents each in the same localities.

In the official records, the Commission observes that the returns are somewhat misleading. The total values recorded for the catches reported annually convey a wrong impression, as the numbers of barrels recorded are barrels of pickled or salt shad, whereas a considerable proportion of the catch was sent to market in a fresh condition, and the reported barrels of shad in certain localities refer to fresh shad, this lack of uniformity in the records conveys therefore no correct idea of the total catch. Fewer fresh shad, probably not much more than half the quantity, will go to make a barrel. Thirty-five or forty years ago, salt shad ran about $7 per barrel. One witness, referring to this former price of shad, said—

We used to split our shad taking the head off, in the back, leaving the backbone in with the tail on. We struck them first in puncheons and repacked them in barrels. They were sent to the States in schooners carrying stone. At that time they were worth here from $3 to $3.50 per half-barrel. Sixty to sixty-five fish would weigh 100 pounds for the half-barrel.

Not only so, but the price per barrel of pickled shad has advanced from $8 per barrel in 1880 to upwards of $20 per barrel within the last two or three years. Indeed, during the past season half-barrels of salt shad have sold as high as $12. A prominent Moncton witness said:—

We sold shad to St. John men by 1,000's of barrels, but we also sold to farmers by the piece, and to St. John by the hogshead. Now for a half-barrel as much as $10 or $11 is the price. I gave $12 for a half barrel for my own use recently. Formerly sixty shad filled a half barrel, but now forty will do, hence the fish are larger now.

Shad culture.

The success of the artificial hatching of salmon and white-fish had been generally recognized in most countries, and Canada has almost taken the lead in developing

this important work, with far-reaching benefit to the great fishing industries of the Dominion. There are no less than thirty-five Dominion government hatcheries now in operation, of which twenty-two are solely or mainly devoted to the propagation of salmon, but, with the exception of one hatchery, at Windsor, Nova Scotia, where experimental work with shad has been tried, nothing has been done by the Dominion government to increase the supply of this valuable fish by means of modern methods of fish culture.

It must be recognized that the shad presents peculiar features in regard to its eggs and development, and especially the obtaining of supplies of eggs. These peculiar features necessitates more careful handling than is necessary in the case of such fish as salmon, both in stripping or procuring the eggs and in the subsequent handling of them in the hatchery. For example, parent salmon, after stripping, are little the worse for the operation and can be liberated into the rivers unharmed, so that the same fish on returning year after year to their own rivers can be repeatedly utilized for hatchery purposes. It is wholly different with the shad. The parent fish, after being stripped, do not as a rule survive the operation and they will not bear the handling which salmon bear, with impunity, so that it is impossible to rely at all for the future supply of eggs upon the shad which have once been used for hatchery purposes and liberated. It is plain, therefore, that every season, a shad hatchery must rely upon a new incoming school of spawning shad. The experience of hatchery officers in the United States fully demonstrates this point.* In a recent report* it is stated—

The operators at Catskill, on the Hudson river, return all the shad to the river, after taken the spawn, as the close season is at that time in force, and the spawned fish are seen to die almost before sinking out of sight in the river. Comparatively few shad, however, will suffice to furnish ample spawn for hatchery purposes. The eggs being small there is considerable diversity in the estimates by various authorities of the number produced on an average by a female shad, 20,000 to 200,000 is the quantity variously estimated. The late Mr. A. N. Cheney held that 30,000 would be the average quantity, and that appears to be a fairly accurate estimate, though some have claimed that 20,000 was the limit, and others have held that a shad produced 10 to 12,000 eggs for each pound of its total weight.

The Connecticut Fish and Game Commissioners in their last report (1909) emphasize the necessity of protecting the spawning schools, saying:—

The diminishing number of shad caught during the past five years prove beyond a question of a doubt that some means should be devised to increase the supply. It is very well known that there are but two sources of supply, natural and artificial, but if a sufficient number of fish do not reach the spawning grounds it is impossible to multiply from either source.

And later in the same report they add the following grave statement regarding the future of the hatchery work:—

Your commission have conducted the artificial propagation of shad on the Farmington river, as usual, during the past two years, leasing the Mud Seine fishing place, also the Manley fishing place.

The results are far from being satisfactory, under the conditions which have become more pronounced, as the run of fish for spawning purposes has been practically

* Professor E. E. Prince, Special Report on "The Culture of Shad," Department of Marine and Fisheries, Ottawa, 1902, p. 37.

wiped out and unless prompt actions are taken, whereby a fair percentage of the shad may reach the spawning grounds, it will be useless to continue operations.

The present state of the shad fishery on our Atlantic coast waters demands that effective methods of restoration be adopted without delay. In our investigations it has been established beyond question that all the conditions for successfully carrying out the propagation of shad by artificial means are present in our Canadian shad rivers. The Dominion possesses some of the most important shad breeding waters on the Atlantic coast. The St. John, Petitcodiac, Shubenacadie, Stewiacke, Annapolis, Nictaux, and other rivers, all have fine spawning grounds where supplies of eggs could be relied upon if adequate means for the protection of the ascending schools of breeding fish were enforced.

There are two methods of restoring a depleted fishery such as the shad fishery, viz.: 1st. Natural spawning by breeding fish without man's interference. This seemed to prove ample in the early days of shad fishing, as the annual supply of these fish in our various rivers was amazingly large. 2nd. Artificial breeding, or hatching of eggs in hatcheries. We are strongly of opinion that as the abundance of shad in former years was due, as just pointed out, to nature's methods of restoration, the present condition of the shad fishing industry imperatively demands that the spawning fish must be protected, that is a first requisite, whether reliance be placed upon the natural method or artificial method. The ascending schools of spawning shad, effectively protected, will, on the one hand, supply the natural beds with spawn as in former days, or, on the other hand, will furnish the supply of eggs absolutely necessary for successful operating shad hatcheries.

It is useless to build shad hatcheries if the parent fish be not protected, as experience in the United States has abundantly demonstrated. "For a few years past the United States Bureau of Fisheries," declared the Rhode Island Commissioners in their report of January, 1908, "has been unable to supply your Commission with shad fry because of a scarcity of spawn."

United States authorities have claimed that shad hatcheries were not commenced early enough in the Eastern States, indeed three or four years ago the 'New York Fishing Gazette,' published an article on the 'Threatened Extinction of the Eastern Shad,' from which we make the following extract:—

Comparison with the work of developing the industry on the Pacific coast with what has been done along the Atlantic has led to the belief that had congress stepped in to the aid of the industry here before now the diminution would have at least been far less marked. The same authority that has made this observation has also pointed with some force to the fact that while the industry is threatened with extinction on this coast, its original habitat, the exact reverse has been the case on the Pacific. On the Hudson where the annual shad run numbered well into the hundreds of thousands some years ago, the catch last year numbered but a few hundreds.

The great advantage of hatcheries lies in the success with which practically all the eggs can be incubated. Hatcheries guard against the waste of spawn which, no doubt occasionally occurs under natural conditions.

The establishment of hatcheries is often urged as the sole solution of the problem of the shad depletion, but other points must be borne in mind. Thus when the State of North Carolina, a few years ago, asked the United States Bureau of Fisheries, Washington, D.C., to investigate the decline of the shad fisheries, the Bureau,

as a first step recommended salutary laws. These were adopted by the State, and, amongst other things, fishing gear was confined to prescribed areas, and the main channels left clear for the ascent of the fish. Albemarle Sound shad hatchery had been able to obtain only 6¼ millions of eggs, instead of the 75 millions secured five years previously. So beneficial were the restrictive regulations that during the first year of their enforcement the number of shad eggs taken rose to 25½ millions, and 1908-9 were nearly the most successful hatching seasons recorded, the egg collections exceeding 55 millions and 60 millions, in the respective years specified.

The Windsor hatchery, Nova Scotia, requires some reference here. It has been successful in the hatching of salmon, as the annual reports of the department show, but the experimental work with the shad has not apparently resulted in such marked success. Various reasons may be adduced for this, but the principal reason no doubt which may be mentioned, is that the temperature of the water, circulating through the hatchery jars, was somewhat high, and so hastened development that the resulting fry were not robust enough to ensure completely successful planting

The Commissioners visited the hatchery in the course of their tour, and were favourably impressed with the building and its surroundings, and they were convinced that successful shad hatching could be carried on and the rivers benefited by the planting of shad fry if certain conditions could be ensured. The first requisite is an ample supply of parent shad, and, as we have already pointed out, protective measures must be employed to secure them in sufficient quantity, otherwise success cannot be looked for. The experience of Connecticut Fish Commission is invaluable. They say, in their 7th Biennial Report (1909):

Experiments have been frequently tried at various points on the Connecticut river, not only by your present commission, but by former commissions as well, to secure mature eggs, but they have always resulted in failure. The fishermen who are taking a keen interest in the preservation of shad, have also been on the alert for the ripe shad egg but report that none were found, in hauling their seines.

Last year at the earnest solicitation of the fishermen, efforts were made early and late during the season, to secure ripe spawn at Hamburg cove, Salmon river and at Rocky hill, but without success, and we are confirmed in the opinion that mature shad eggs in any considerable number can not be procured down the river so far, nor indeed any great distance below the Farmington river. The importance of articial propagation is fully realized by the fishermen, and its effects on the fishery is the best illustration of the value of fish culture.

Your commission have conducted the artificial propagation of shad on the Farmington river, as usual, during the past two years, leasing the Mud Seine fishing place, also the Manley fishing place.

The results are far from being satisfactory, under the conditions which have become more and more pronounced, as the run of fish for spawning purposes has been practically wiped out.

In 1907 we made 51 hauls with the seine to capture the 80 ripe shad which produced the 191,000 eggs, and in 1908 it required 108 hauls with the seine to capture the 30 ripe shad which yielded the 485,000 eggs. The figures are extremely interesting and brings us very close to the true conditions existing in the shad fishery, and the question we face to-day is the ultimate commercial extinction of the shad. It is sure to come unless effective protection is secured. Unless something is accomplished more effective than anything heretofore done, it seems certain that the day is within measurable distance when our shad fishery will be a matter of history.

That the artificial propagation of shad can do much to replenish and restore depleted waters, or even introduce them into new waters, is amply proved by the history of shad culture in the United States.

The "New York Fishing Gazette" said a few years ago—

Seth Green and Livingstone Stone, two pioneers in American fish culture, whose names are now known wherever fish culture is practiced, were associated with the initial experiment which took place in 1871. In that year the California Fish Commission arranged with Green to take a lot of young shad from the Hudson river to California. He took 12,000 newly hatched fish in four eight-gallon milk cans, and by great effort and tireless vigilance, he succeeded in planting 10,000 of them in the Sacramento river, 275 miles above Sacramento. The second lot was taken to Sacramento in 1873 by Livingstone Stone. He planted 35,000 young shad.

In 1876, 1877, 1878 and 1880 other shipments of 574,000 in all were planted in the same river, and in 1885 and 1886, 910,000 shad fry were placed in the Columbia river. These small fry apparently prospered, for in April, 1873, a shad believed to be one year nine months and twenty days old, and weighing three pounds, was caught in San Francisco harbour, and the State Fish Commission gave a reward of $50 to the angler. In 1879 they had become numerous, and by 1883 they were reported in some places to be practically in unlimited supply, the price becoming less than in other states.

And a later reference to this Pacific shad work furnishes some further interesting facts:

One of the most remarkable achievements of the Bureau of Fisheries has been the successful introduction of the shad into the waters of the Pacific coast. Way back in 1871 the California State Fish Commission planted 12,000 of these fish in the Sacramento river. The enterprise was then taken up by the United States Fisheries Commission and carried on until 1886, during which period about 1,519,000 fry were deposited at different points along the west coast. Their new home proved favourable, and from the initial slender colonies, aggregating less than 1 per cent of the number now annually planted in the Atlantic slope rivers, the shad have multiplied and distributed themselves along 2,000 miles of coast, from the Golden Gate of California to Vancouver Island in British Columbia. Indeed, these fish, following the warm Japan current, have made their appearance in the rivers of Alaska. The United States, it is recorded, have planted in all, over three thousand millions of shad fry in the coastal streams.

A serious depletion of shad renders it difficult to restore the supply even by hatcheries. As the State reports of North Carolina said not long ago: "With the recent exhaustive fishing . . . . so few fish escaped the nets that the egg collections have diminished to an alarming extent, being reckoned by millions now, whereas formerly they were hundreds of millions. Under such conditions it is impossible to propagate enough fish to offset the quantities taken, and the shad fishery is fast being deprived of its one support, while the present meagre catches together with the enforced curtailment of propagation, speaks even more convincingly of the value of artificial measures."

During the period of nearly forty years, since the United States federal authorities introduced shad on the Pacific coast and carried on shad hatcheries there, the benefit to the fisheries between San Francisco and Puget Sound has been estimated to amount to a total money value of nearly a million dollars. The outlay on this initial work of transplanting shad and of carrying on hatching operations on the

western coast did not exceed $5,000, according to the "New York Fishing Gazette," December 22, 1906.

There are several methods of hatching the eggs of the shad, the earliest being an invention of the famous Seth Green, to whose work reference is made in the special report of the Marine and Fisheries Department 1902* This report states.—

The most reliable source of supply for shad spawn is on the natural spawning grounds. There the fish become active towards evening, and crowd together about twilight on calm nights in late May and early June, where they can be seined and the spawn and milt taken by the usual process. More than the usual delicacy in handling, and care in collecting must be exercised or the fragile eggs will be damaged. Professors Jordan and Evermann in a recent popular work (American Food and Game Fishes) speaks of the shad's eggs as 'very small, semi-buoyant, and usually requiring six to ten days hatching.' but as I have pointed out that while the eggs are very translucent and of extreme delicacy they are really comparatively large being in fact only one-quarter less in diameter than the eggs of the speckled trout, and they readily hatch in June in two and a half or three days, though Mr. Cheney found that they hatch in three to nine days being spring spawning fish. It is essential that scales, blood, mucus, &c., be not allowed to fall into the buckets or dishes into which the eggs are spawned. They have sufficient buoyancy to dance about in the water if only slightly agitated, and in perfectly still water they are barely heavy enough to sink. They appear to be midway between the buoyant floating eggs of marine fishes such as the cod, haddock and mackerel, and the heavy demersal ova of the herring, salmon, trout, &c. Perfectly clean fresh water must be used lest particles of mud cling to the slightly adhesive newly spawned eggs. The hatching is carried out either in the usual cylindrical hatchery jars, with the flow of water so arranged as to keep them in motion, or they may be placed in flat boxes with small perforations in the bottom, and fixed at an angle so as to secure a flow of water from the bottom: but only sufficiently strong to secure their constant movement and aeration. The first successful hatching box or floating tray was devised by that ever-to-be-remembered pioneer in western fish-culture, the late Seth Green. Mr. Livingstone Stone has told us how, when he visited Green at Holyoke in 1867 he found him tackling the difficult problem of hatching shad eggs. His attempts had been a failure. 'The peculiar character of the eggs, and the peculiar treatment required for them had baffled for a time even his keen-sighted genius and he had in despair almost decided to give it up and return home.' He persevered, however, and invented the gauze covered box. 'It was a pleasant thing' Mr. Stone has told us, 'to see the change in Green's spirits that came with the first success in hatching shad. It seemed a little thing—nothing but some little delicate living embryos appearing in the frail eggs that he was working over.' Mr. Lyman described the arrangement, whereby Green contrived that the box should float 'with one end tilted up, and the current striking the gauze bottom at an angle, is deflected upwards, and makes such a boiling within as keeps the light shad eggs constantly free and buoyed up. The result was a triumph. Out of 10,000 ova placed in this contrivance, all but seven hatched. In spite of delays, and of the imperfect means at hand for taking the fish, Green succeeded in hatching and setting free in the river many millions of these tiny fry.' The small wriggling larva that bursts out of the egg in 60 to 180 hours, is like all the young of the herring family, indescribably delicate. It is about one-third of an inch long or less than half the length of a salmon, just hatched, and has all the frail characteristics of the family clupeidae to which the shad belongs.

Instead of planting these frail and delicate shad fry it has been urged that they should be reared to the strong fingerling stage. Such rearing has been long regarded

* Professor E. E. Prince's Report on Shad Culture, 1902, p. 39.

as peculiarly difficult if not impossible. In a report on the young stages of shad, gaspereau and herring in the "Further Contributions to Canadian Biology," published in 1907, as a scientific supplement to the report of the Marine and Fisheries Department, it is stated that at the twentieth day after hatching the European shad is over three-fifths of an inch long, but on the thirty-fifth day it is four-fifths, and on the forty-third day nearly one inch long. In its fourth month the shad is claimed to be 5 to 7 inches long, at which age the sea-herring is only about 1¼ inches long. The report goes on to say*—

The gaspereau, from an experiment reported to have been carried out in Maine, U.S., by Messrs. Treat & Son, reaches a length only half that of the shad at the age when the shad is 3 to 5 inches long (4 months old). Of course, such fishes, when confined in rearing ponds, are probably dwarfed in their growth, and may not afford a certain clue to the determination of the age of specimens captured in their native waters. Shad have, for instance, been taken 3 to 4 inches in length in February, while specimens of the same length have been secured in great numbers in September; and in the Potomac river examples 3 inches long are abundant in November, while about the first of that month shad 5 to 7 inches long are plentiful in the Maine rivers. According to my observations, the first named specimens (3 to 4 inches long) must have been hatched out in November or December, a supposition which raises a difficulty, as shad enters rivers, in December and January, on the Atlantic coast, only as far south as Georgia and Florida, while the small shad of the size named, captured in September, as in the Potomac river, must have been hatched in June, though the main ascent is as early as April in that river. Shad 9 to 13½ in. long are frequently taken in Canadian waters in October, and as these fish cannot possibly be only four months old, and must be the young of the year preceding, especially as shad 3 or 4 inches long are also captured about the end of October, and schools of fish 4 to 5 inches long are observed in December. We know that shad are apt to migrate along long distances of sea shore, as on the Pacific coast, where they have spread far from the rivers where they were originally planted, so that they are not so true to their native rivers as the salmon, and this may explain the very discrepant nature of the facts alluded to.

The New York Forest, Fish and Game State Commission have energetically taken up this matter of rearing shad beyond the delicate fry or newly-hatched condition, when the shad is one of the most tender, transparent and diminutive of river fishes and the following recent extract from "Rod and Gun in Canada" is of special interest and importance:—†

One of the interesting things in connection with the Fisheries Branch of the New York Forest, Fish and Game Commission, is the work of rearing shad. It is believed not many are aware of the fact that the department is producing at least $500,000 worth of fry and fingerling fish each year, and distributing them in state waters. A hatchery has been erected at Linlithgo, near the city of Hudson, primarily for the purpose of rearing fingerling shad to restock the Hudson river. As a secondary matter it is producing small mouth bass, striped bass, perch and this year 500,000 trout fry. Rearing shad is a new business. They are a very delicate fish to handle; in fact to actually handle them kills them. They hatch quickly and grow rapidly. Experience thus far has not been altogether satisfactory. 'We feel sure far better results will be obtained in the future. Our men have learned something about the rearing of shad. It is plain, now, the secret is to have very large ponds and not too many shad in each. Millions of small trout may be crowded together in a small

* The Eggs and Young of the Herring, Gaspereau, Shad, &c., by Professor E. E. Prince, Dominion Commission of Fisheries, Ottawa, p. 104.

† June 'issue,' Woodstock, Ont., 1910, page 94.

space and thrive for a time—not so with shad. In 1888 the National Government placed 3,000,000 shad fry in a pond at Washington having an area of five acres; 50 per cent were grown to fingerling size; that was considered good work. At Neosho station, in Missouri, 1893, 200,000 fingerlings were produced from 700,000 fry sent from Washington. That was considered fairly good work under the conditions existing there. 'We have many things yet to learn about the rearing of shad; however, the evidence so far produced indicates that it may be successfully done at the new hatchery and shad fishing in the Hudson much improved thereby. When all the ponds are completed the Linlithgo hatchery will be one of the best in this country.

International aspects of the Shad question.

A number of witnesses, at several sittings of the Commission, claimed that to properly deal with the shad question would involve some reference to the shad fisheries of the United States, inasmuch as there has been a long established opinion, held by different parties, that the shad fisheries of the Bay of Fundy are, in many ways, closely connected with the more southern fisheries of the United States. We have, in the main body of our report, expressed our views as to the relation of the Canadian and United States schools of shad; but there can be no doubt that at the border line the shad fishery has assumed an international aspect, and it is important to notice that the question came up before the International Fisheries Congress at Washington in September, 1908. During the progress of the Commission's work, the chairman of the Commission had been appointed by the Dominion government as representative of Canada at the Fisheries Congress in Washington, and this gave him an opportunity of bringing up the question of the international aspect of the shad fisheries. As Commissioner from Canada, the chairman was able to bring before the Congress a resolution on the shad fisheries, and the matter was discussed by the distinguished representatives from different localities interested and it was agreed that united action on the part of Canada and the United States would be a great aid, especially by the formation of uniform regulations and the carrying out of a common policy in protecting and restoring the shad industry. Further, an International Fisheries Commission was appointed under the treaty of April 8, 1908, under which the chairman of this Commission, and President Starr Jordan, of California, were authorized to formulate a code of International Regulations. The shad fishery is one which will without doubt come under the purview of this Commission, and the action suggested by the International Congress will be given full consideration by the Commissioners representing the two countries.

Salmon and Gaspereau.

To the instructions originally issued to the Commission were subsequently added directions to report on these two important fisheries—salmon and gaspereau—carried on in the same bays, rivers and waters generally in which the shad fishery is conducted.

It must be noted, in the first place, that the schools of salmon and gaspereau do not ascend to the spawning grounds at precisely the same time as the shad, and the fishing is not contemporaneous, although it may be that in some localities shad fishing is ostensiby carried on, when salmon are really the fish caught.

We have already referred to existing conditions, under which salmon and gaspereau are fished, the conditions being that gaspereau are taken early in the season, viz., in April, before the principal shad schools appear, and a mesh of net is used, which is not suitable for the larger species of fish. The mesh of the gaspereau nets is from 3 to 3¼ inches, and these dimensions are too small to take shad, except odd ones, even if the large schools of shad were then running. Hence, there is comparatively little danger to the shad supply from gaspereau fishing. On the other hand, the proper mesh which we specify for salmon will not readily take shad during the time when the close season for shad is in force. As the law stands, salmon drifting is not permitted in Nova Sotia under the Fisheries Act, while in British Columbia and in New Brunswick such fishing is permitted; and we recommend that this regulation should uniformly apply to the three provinces named, as stated in our interim report. On the whole, the existing salmon regulations appear to be fairly satisfactory, with the exception of the matter of salmon drifting above referred to; but as the shad and salmon are taken in the same nets, it is necessary that the same legal conditions should be applied to both fish. The present conditions are a serious detriment to the salmon supply. In the interests of those who have money invested in boats and gear and who are recognized salmon fishermen, a permit system, in our opinion, should be introduced. We have elsewhere recommended that the one permit should cover both shad and salmon fishing, and we have little to add to the observations which we have embodied in our interim report respecting the two fisheries mentioned, viz.: salmon and gaspereau.

Angling for young Salmon.

The attention of the Commission was drawn to the destruction of young salmon in early stages, viz.: the "parr" or first year stage, and the "smolt," which is the second and third year stage.

This destruction, especially by boys, is said to be carried on to a serious extent, and may no doubt be due to ignorance of the fact that these small fish are the young of the salmon.

Evidence was given that in some localities they are confused with young trout. Of course the young of neither of these important game fish can be legally taken, as section 47, subsection 9, of the Fisheries Act expressly provides that "No one shall fish for, catch, kill, buy, sell or possess, the young of any fish mentioned in this Act, or in any regulation under it."

The complaint laid before this Commission referred to salmon, and in order to protect the young salmon especially, we would favour the posting of official notices in the neighbourhood of salmon rivers, printed on strong white linen or cotton, calling attention prominently to the illegality of fishing for and taking the young of salmon in the "parr" and "smolt" stages, and quoting section 14 of the Act. We also are of opinion that section 13 might be included on the same official notice.

PART II.

Conclusion of the report and recommendations.

The restoration of the shad supply to something like its former condition is the great object of the work of this Commission.

With the view of accomplishing this end with the least possible friction to existing interests and to restore as speedily as possible this valuable and important fishery; and to save it from that total and complete extermination which now threatens it, be beg to submit our recommendations, with added observations thereon.

These recommendations were, in the main, briefly set forth in our interim report presented to the Honourable the Minister, on February 6, 1909, and which report is appended hereto, but the grounds for our recommendations were not fully set forth therein. Before proceeding to indicate the grounds referred to, we would again direct attention to the desirability of establishing hatcheries and of restoring the supply of shad by the modern methods of fish culture which have proved so successful in the United States. In the course of our tour as a Commission we have found in various localities that most favourable conditions exist for successfully conducting the work of the propagation of shad, and we are of opinion that if vigorous action is taken, along the lines of the recommendations herein submitted, the depleted shad fisheries can, we have confidence, be restored in a period of three years. Moreover, the cost of building shad hatcheries and of operating them appears to be much less than is the case with the hatching of salmon and other species of fish. Hatchery buildings need not be expensive, and the hatchery plant and the labour necessary are less costly than in the case of salmon, whitefish, &c., especially as the period during which it is necessary to carry on hatchery operations is comparatively short

We preface our recommendations by urging that in official statistics shad should be reported as counted by the hundred, or by pounds as in the case of salmon. When recorded barrels the totals are misleading as already pointed out under the heading 'Prices of Shad.'

Various other kinds of fish are taken by the fishermen when fishing for shad and salmon, and these should be reported on separate lines in the returns which the fishermen are required to make to the local officer. In the form we suggest (see Appendix 7) six blank lines are provided, on which to enter 'other fish,' such as cod, pollock, striped bass, dogfish, sturgeon, &c. Apart from the statistical value of these details, such returns afford information as to the increase or decrease of injurious fishes, like the dogfish, &c.

I. With reference to our recommendation No. I, confining shad nets to tidal waters only, we may say that in the evidence given at our sittings it was clearly proven that shad, when frequenting waters other than tidal waters are either ascending to spawn or actually engaged in spawning or descending in a foul, unclean condition after having spawned, and should not be captured. The schools of very small shad, is stated, descend during the late summer and in the fall and the prohibition protects these shad when they should not be captured, and the small immature shad

as well. Important dealers who appeared before the Commission declared that shad after spawning were unfit for food and, in the course of business, they would not purchase or handle them.

The exception which is applied in our report to St. John river and its tributaries takes into account the peculiar conditions which surround the weir fishery in St. John harbour, regarding which St. John city has special and exceptional prerogatives, and also with regard to recommendation No. II. which is applicable generally, and under which shad and salmon fishing would be prohibited from August 15 in one year to July 1 in the year following, for three years following the adoption of these regulations submitted. It must be observed that, under these conditions, salmon nets of the mesh of 6½ inches extension measure may be used from March 1 to August 15 in each year.

II. This recommendation, No. II. will, in a great measure protect shad by confining fishing operations to 1½ months, viz.: July 1 to August 15, for a period of three years. Moreover the mesh of salmon nets provided, viz.: 6½ inches, from March 1 to August 15, will not take shad but will allow salmon fishing to be carried on with the mesh specified.

III. We have in this suggested regulation recommended the adoption of the terms used in subsection 14 of section 47 of the Fisheries Act, chap. 45, 1906, so that instead of sunset and sunrise we recommend that the terms be low water nearest 6 o'clock in the morning and evening, the terms thus used in the Act and in the fishery regulations under the Act will then as far as possible be uniform.

IV. In this proposed regulation the provision of a fish gate, as already required by a special regulation in the fishery laws for Digby county (Nova Scotia Special Regulations, 1907, section 20, subsection 3), is made general in New Brunswick and Nova Scotia in the area within which, by our recommendations, weirs would be permitted. The Commission is aware that the department nearly twenty years ago took steps in this direction by requiring fish escapes in all weirs in St. John harbour. (Order-in-Council, June 6, 1892.)

V. This recommendation adopts the words of the existing regulation (Nova Scotia Regulations, section 20, subsection 10 and 11), except that instead of permitting all kinds of fish to be so dipped, gaspereau or alewives only are permitted, in order to protect shad and salmon. This recommendation has been already enforced in Shelburne county (Nova Scotia Regulations, section 20, subsection 18).

VI. The Commission found that different lengths of nets have been used in shad fishing. For example, in Nova Scotia the length used ranges from 600 fathoms down, while in New Brunswick the maximum length used appears to have been about 250 fathoms. The regulation now suggested establishes a uniform maximum length, about 300 fathoms, or a quantity not exceeding fifteen bunches of twine, during the three years specified in recommendation No. II.

VII. In order to hasten the restoration of the shad fishery and to enable the protective steps suggested to be effectively carried out, the present lax method under which fishing is carried on should be replaced by some method of issuing a permit. Under such a system, all fishermen entitled to engage in the shad fishery would be enabled to carry on their operations under the permit with conditions specified. This recommendation is made in order to avoid promiscuous and unlimited fishing during

the years when the attempt is being made to restore to their former plentitude the shad of the Bay of Fundy. The salmon fishery, in our opinion, should be also included in this recommended step (see our suggested regulation 19h.)

VIII.—This recommendation appears to us essentially necessary to ensure the success of the shad hatching operations recommended. Were the reserves established which we recommend, supplies of parent shad could be obtained in the waters mentioned, and as these reserves provide all the most favourable conditions for successful planting of fry, they should be extensively stocked with young shad from the hatcheries, so that the waters of the bay may be benefited and the schools of shad restored to abundance as rapidly as possible.

IX. The Commission are convinced that the measures here recommended would be futile and without result were the wholesale destruction of shad by brush weirs, stake seines, &c., to continue in the area referred to, as in former years. During the three years specified, the stationary engines named should be closed down, in view of the enormous catches made by them and the fact that all sizes were in former years captured, both mature and immature. At the present time, the fishing of these stationary engines is unremunerative and fishermen actually engaged in this fishing have urged, as is seen in the evidence, the closing down of weirs, seines, &c., but set nets, which gill the fish, would of course continue and no harmful results can follow, as the 5-inch mesh will not take small, immature fish.

It will be observed that the weir prohibition does not apply to St. John harbour or to the Nova Scotia shore, west of Stephen Bennett's bay, the special reason being that the shad are not taken by weirs in the localities mentioned, to any extent, while the salmon fishery has been so extensively carried on, and is of such an important and profitable nature, that the same reasons for prohibition do not exist, so far as shad protection is concerned, as exist further up the bay. The weirs in Digby basin are permitted under our recommendation, because the chief catches are herring, haddock and other fish, that is, fish other than shad or salmon.

From the evidence brought before us and from the authorities which we quote in this respect, the St. John river has been pre-eminently the source of supply of shad for the Bay of Fundy waters. It is, therefore, in the highest degree necessary that the shad ascending to spawn should be given every possible protection to enable them to reach their breeding grounds, especially by the prohibition of net and weir fishing where it interferes unduly with the ascent of the shad. In St. John harbour such prohibition is not called for, as the shad are not taken, except to a small extent, by the harbour weirs, which mainly take salmon and other fish.

X. This recommendation aims simply to make uniform the permission to use dip nets in Lequille river or Allens brook, as well as Round Hill river.

XI. The amendment here suggested is necessary, as the geographical limit at present defined is a disadvantage in the protection of the shad schools ascending the Shubenacadie river.

XII. Respecting the increased patrol which we so strongly urge, we may say that our statements in the interim report are self-explanatory and need no expansion now.

Our recommendations Nos. XIII, XIV, XV, XVI and XVII do not require extended explanation, as the imperative necessity of shad hatcheries has been already

fully dwelt upon in the body of this report, while the desirability of giving greater publicity to the regulations, by means of linen posters prominently displayed in the fishing localities requires no argument. It is desirable, as suggested in recommendation No. XV, that the meaning of "foul" and "unclean" in the Fisheries Act and regulations under it should be clearly defined, and also that "shad" should be more prominently mentioned in the Act, inasmuch as salmon trout, cod, lake whitefish and other species receive prominent mention in some clauses in the Act.

Again, recommendation No. XVII, referring to dams and obstacles to the ascent of fish, sawdust pollution, &c., this is a recommendation of supreme importance and requires urgent attention. The harm arising from sawdust, we have dealt with in the body of the report. Flagrant cases of the obstruction of shad and salmon rivers by dams came prominently to our notice in the course of our investigations, and some notable examples call for mention, especially such a huge obstruction, 50 feet high, as that on Salmon river, nine miles above Truro and adjacent to Union station. This productive salmon river has been, in recent years, most seriously damaged on account of this obstruction, and as the evidence showed, the main cause of the decline of the fishery was attributed by witnesses to this cause. Other examples could be named of obstructions on important rivers.

Finally we would call attention to the verbal and other changes in the existing regulations, which we refer to in detail in the last portion of the interim report under Nos. XV, XVIII and XIX. Such changes are rendered necessary by the recommendations hereby made.

Conclusion.

In conclusion, we have only to add that, in one form or another, the restoration of the great shad fisheries of the Bay of Fundy, so important in former years to the whole resident population, has been before the Department of Marine and Fisheries for over a quarter of a century, indeed almost from the earliest official reports, published by the Department of Marine and Fisheries, attention has been called to the lack of effective regulations respecting this important fishery, and in recent years the marked decline of this industry has brought about a crisis, which can only be met by such measures as those we have recommended in the foregoing report and in the interim report appended hereto.

Our recommendations, we believe, will be effective with the least amount of friction to the various interests concerned and with the least loss to those actually engaged in the fishery. The consensus of opinion brought out by the evidence, has demonstrated that the time has arrived when some remedial legislation must be authorized and enforced to prevent the total depletion of this fishery, which was once so prosperous and remunerative. Wherever local interests may appear to be affected by our suggested regulations, we have made recommendations to, first of all, restore the fish to plentitude, and secondly, to avoid unfair or unnecessary discrimination against any locality or any resident parties interested in the industry.

We have attempted to make as full and thorough a survey of the shad fisheries of the Bay of Fundy as was possible and as appeared necessary, and we have also paid

attention, in the course of our work and in accordance with our instructions, to the salmon and gaspereaux fisheries, and we have aimed to reach just and true conclusions—which we have embodied in our recommendations.

All of which is respectfully submitted.

(Signed) SIMON MELANSON,
SAMUEL F. MORRISON,
Commissioners.
EDWARD E. PRINCE,
Chairman of the Commission.

OTTAWA, May 28, 1910.

PART III.

INTERIM REPORT

OF THE

SHAD FISHERY COMMISSION

1908-1909

WITH LIST OF WITNESSES, LIST OF SITTINGS, AND SEVEN APPENDICES.

Part III.

INTERIM REPORT

OF THE

SHAD FISHERY COMMISSION

1908-1909

To the Honourable L. P. Brodeur,
The Minister of Marine and Fisheries,
Ottawa.

Sir,—We, as the members of the commission appointed to investigate the shad fisheries of the Bay of Fundy and adjacent waters, have completed our inquiries and at thirty-two public sittings have received a large amount of valuable evidence from fishermen, fish dealers and other parties interested in this important industry.

We found wherever we went in the course of our investigations that the action of the government in moving in the matter received the warm approbation of the public generally, and in view of the fact that the shad fishery as a valuable industry and a source of food supply has reached a most critical stage and will be wholly a thing of the past unless adequate restorative measures be immediately devised and executed, the work of the commission was regarded as most opportune.

CONDITION OF THE FISHERIES AND CAUSES.

In our full and final report, to follow this interim report, we shall deal in detail with the points here referred to incidentally, but we feel bound to report that the opinion universally prevails amongst those interested that the decline of the shad is so serious as to demand urgent means for its improvement. Various causes are adduced to account for its present serious condition and the necessity of effective measures being carried out immediately. It is a remarkable circumstance that the shad is only mentioned in the Fisheries Act in a subsection of minor prominence, and in the regulations the shad fishery, so vital and valuable to the maritime provinces, has not received, heretofore, the adequate recognition to which its importance entitles it, and is referred to only in certain subsidiary clauses in the New Brunswick and Nova Scotia Fishery Regulations. The salmon and the shad fisheries are most intimately connected in the Bay of Fundy waters, both fish being caught mainly in the same nets and during the same period of the year. The salmon has steadily increased in quantity and also in the size of the fish, an improvement it is universally agreed, directly due to the propagation of these fish by the Dominion government hatcheries. While this is

true of the salmon the opposite is manifest in the shad which has steadily declined for the last twenty-five or thirty years, and the shad, it may be noted, has not been long included in the Dominion system of fish culture and has been excluded from proper protective regulations.

In view of the condition which now exists and abundantly established by the mass of evidence received at the sittings of the commission, we submit a first series of the recommendations which we regard as urgent and calling for immediate sanction.

Various causes have no doubt combined to bring about the present serious condition of the shad fishery. Amongst these may be mentioned:—

(1) Dams and other obstructions in rivers, preventing the parent fish from ascending to their spawning grounds.

(2) Catching the breeding fish when ascending the river to spawn.

(3) Overfishing by seines, weirs and nets.

(4) The pollution of rivers and feeding grounds by sawdust and mill refuse and other deleterious substances, one of the most flagrant cases being the Kennetcook river, Hants county, at one time a fine shad and salmon river.

RECOMMENDATIONS OF THE COMMISSION.

The recommendations we beg to make are as follows:—

(1)—*Shad Nets in Tidal Waters Only.*

The use of nets and other apparatus for the capture of shad shall be confined to tidal waters only. Except that the St. John river, New Brunswick, and its tributaries nets only shall be allowed above the Reversible falls, and nets and other apparatus below the said falls.

(We note that the Fisheries Act. Sect. 16 applies to salmon only.)

(2)—*Annual close time for Shad and Salmon and open season for Salmon Nets of 6½ inch mesh.*

The use of nets for the taking of shad and salmon to be prohibited from August 15 to July 1, in the year next following, and during three consecutive seasons thereafter, provided that salmon nets of a mesh not less than 6½ inches extension measure may be used from March 1 to August 15.

(3)—*Weekly close time for Salmon, Shad and Gaspereau.*

From the time of low water nearest six o'clock in the afternoon of every Saturday to the time of low water nearest six o'clock in the forenoon of every Monday no one shall fish for, catch or kill salmon, shad or gaspereau in tidal waters, excepting in the estuary and waters of the Port Medway, &c. (*Vide* N. S. Fishy. Regs. Sec. 10, ss. 2.)

(4)—*Gates in Brush Weirs.*

In the waters of the Bay of Fundy all brush weirs, of whatever description, shall be provided with gates, placed in the hurdle or deepest place; such gates to have an opening of at least eight feet in length by four feet in height, hinged at the top with iron straps, and provided with sufficient tackle attached to an upright timber, so that

said gates may be raised at any time of tide. There shall be gates as above described for every one hundred and fifty feet of weir; but in every case these shall be placed as above directed in the deepest water. These gates shall be opened at or before six o'clock on every Saturday night, and remain open until Monday morning at six o'clock.

4. To prevent the destruction of young fish, every owner, occupier or person in charge of a weir shall, either by himself or by those employed under him, enter his weir in a boat before half tide ebb, ascertain the quality of the fish taken, and if young, or small, shall immediately open the gates to permit the fish to escape.

(5)—*Dipping Privileges in Digby County.*

Owners of land along any falls in any of the rivers of the county of Digby shall be allowed one stand for dipping gaspereau only, to be selected by the owners and pointed out to the overseer, who shall determine what claims they are entitled to, and to hold the same as their fishing privileges.

When the width of any falls shall exceed twenty feet, any person, except the owner of a stand, may anchor a boat in said falls for the purpose of dipping gaspereau only; provided that he does not interfere with the special privilege of owners of stands; and every boat so moored shall, after loading, make room and give place for others, by removing when requested to do so; and to prevent the intent of this clause from being defeated, no such fish shall be salted in any such boat nor any such fish shifted from one boat to another. When the river is less than twenty feet wide, no boat or craft of any kind shall be allowed to occupy any such public privilege in said river the second or any subsequent time until each man requesting the privilege shall have had his turn.

(6)—*Mesh and Length of Shad Nets.*

(*a*) The meshes of nets for capturing shad shall be not less than 5 inches extension measure, and nothing shall be done to practically diminish their size.*

(*b*) The said nets shall not exceed fifteen bunches of twine or about three hundred fathoms in length.

(7)—*Shad and Salmon Fishing Permit.*

During the three years specified for the operation of these regulations every person engaging in shad and salmon drifting shall annually obtain a permit issued, without fee, by the local fishery overseer, one of the conditions of which is that the applicant therefor shall have previously engaged in fishing and be possessed of the necessary gear and shall render at the close of each fishing season on or before September 30 in each year, a true and accurate return of his catch of fish on an official form to be obtained from the said fishery overseer.† The second condition shall be that under each permit not more than one boat and net shall be used in the fishery and not more than one permit shall issue to each party.

A third condition shall be that each permit shall bear a distinctive number and

* The Commission recommends that the local fishery officer be empowered to permit nets of a smaller mesh, already in use, to be used until worn out.

† Salmon nets not less than 6½ inches extension measure should be allowed, as heretofore, from March 1st, in each year, for which a permit should issue in addition to the Shad and Salmon permit specified in Recommendation No. 7.

this number shall be marked on every net buoy, and on every tablet securely attached to each net fished by the holder thereof.

NOTE:—

(In Annapolis Co. the following regulation is in force under sec. 16 of the regulations.)

(6) Every net-buoy shall have the name of the owner, and the number of his fishery upon it, either in red letters or branded with hot iron; and every net shall have a tablet securely attached to it, with the name and number of its owner upon it, as above.)

(8)—*Reserves for the Propagation of Fish.*

That in accordance with the power vested in the Honourable the Minister by section 65 of the Fisheries Act, chapter 45, the following rivers shall be set apart for the propagation of fish, viz.:—

(1) The Annapolis and Nictau, above a line drawn across the Annapolis river 100 feet below Bridgetown bridge.

(2) The Gaspereau river from its mouth or outlet.

(3) The Avon river above a line drawn from Avondale Landing to Young's wharf in Falmouth.

(4) The Shubenacadie river, from a line drawn across the river 100 feet below the bridge at Shubenacadie village.

(5) The Stewiacke river above a line 100 feet below Dickey's mill-boom at the Intercolonial Railway bridge.

(6) The Petitcodiac river, above a line drawn across the river 100 feet below Coverdale and Moncton bridge.

(9)—*Prohibition of Weirs, &c., in Chignecto and Minas Waters.*

That all weirs of brush, wire or net and all seines be prohibited above an imaginary line drawn from the county line between St. John and Albert counties, New Brunswick, to Cape Chignecto, Nova Scotia, and thence to Cape D'Or and continuing to Cape Split, thence by a straight line drawn from Cape Split to Stephen Bennett's bay.

(10)—*Permit Two Days Dip-netting each Week in Lequille River as in Round Hill River.*

That subsection 8 of section 16 of the Nova Scotia regulations be amended by the insertion after the words 'Round Hill river' of the words 'and Lequille river or Allen's brook' so that dip-netting shall be permitted on Wednesday and Thursday in each week on both rivers.

(11)—*Shubenacadie waters to include Grand Lake and Upper Waters.*

That the waters of Shubenacadie river instead of being limited by Halifax county line as provided by subsection 1 (*a*) section 18 of the Nova Scotia regulations shall be extended to include Grand lake and all the head waters of the Shubenacadie river, and the clause (*a*) be amended accordingly.

(12)—*Increased Fishery Patrol.*

To ensure the proper protection of the fish on the spawning grounds an increased patrol service is absolutely necessary. It is desirable that active special officers, not

resident in the locality apportioned to them but brought from other districts, should be appointed in five important areas for May and June in each year, viz.:—

(1) Annapolis river.

(2) Shubenacadie and Stewiacke rivers.

(3) Petitcodiac river (above Salisbury bridge).

(4) Kennebecasis river and Hammond river.

(5) Washademoak and Grand lakes and St. John river, New Brunswick.

The officers on the Kennebecasis river and Washademoak lake should be provided with gasoline launches or they cannot carry out an effective patrol. Minor fishery officers whose duties will be less urgent and exacting should be appointed to patrol in the fall each year the following rivers:—

(1) Gaspereau river.

(2) Salmon river.

(3) Great Village river.

The fishery overseers and guardians hitherto authorized have not effectively protected the shad, gaspereau and salmon, and it is desired that they be required to more actively enforce the law, and with the aid of the additional special patrol officers now recommended the restoration of the valuable fish named will be more rapidly accomplished.

(13)—*New Hatcheries and extended Shad-hatching.*

With the protection of the spawning fish a larger supply of eggs, especially of the shad, will be ensured for hatchery purposes, and we strongly recommend that shad-hatching at the Windsor Hatchery, Nova Scotia, be extended and that shad eggs be be hatched at the Bedford Hatchery for stocking the Shubenacadie river, while a floating hatchery would be appropriate for the St. John river and might be located at Jemseg and moved to other points season by season. A cheap scow could be hired or purchased at St. John and a house at a small cost erected thereon, and if located close by the spawning grounds of the shad, abundant supplies of eggs could be relied on, and the fry planted in the immediate locality. An admirable site for a shad hatchery exists near Middleton and a cheap building could be erected there for stocking the Nictau and Annapolis waters. There are several creeks at the head of St. Mary's bay formerly resorted to by shad and these could be stocked from the above suggested hatcheries.

(14)—*Regulations on Linen to be Prominently Displayed.*

It is desirable that the regulations for the shad, salmon, &c., be printed on strong linen cloth, and posted in conspicuous places along the banks of the waters here reported on, also at post offices, &c. We find that the fishermen are not familiar with the regulations, and violations occur very frequently in ignorance of the law.

(15)—*Meaning of Foul and Unclean Fish.*

The existing uncertainty as to the exact meaning of 'foul and unclean' salmon is a source of difficulty. We recommend that more explicit terms should be used and that shad should be included in such a prohibition as section 13 of the Fisheries Act, chapter 45.

(16)—*Shad should be named in the Act.*

It is a grave omission that so important a fish as the 'shad' should be named in the Fisheries Act only in such a clause as sec. 47 ss. 8, rather than in section 43 of the Act, and the omission has created the general impression that the shad is unimportant from an official point of view, whereas it is commercially of high importance.

(17)—*Dams and Rubbish Obstructions.*

Notwithstanding that the Fisheries Act, chapter 45, section 46, provides that fishways shall be constructed in dams where the minister so decides, there are numerous streams resorted to by spawning shad salmon and gaspereau, that are more or less seriously obstructed and the fish prevented from reaching their breeding grounds. In some instances accumulations of rubbish, old brush fences, stakes, &c., form obstacles to the ascent of the fish and these should be removed by the local fishery officers. In the case of the Nine Mile river, a tributary of the Shubenacadie river, we find that large schools of shad ascend each season and spawn, but the river after they pass up, dries, and great quantities are destroyed, and we recommend that about May 1 a fence of wire netting be erected across the mouth of this river so that the fish will be directed up the main Shubenacadie river, where extensive spawning grounds exist.

(18)—*Substitute 'Gaspereau or Alewives' for 'Fish,'* N. S. Regulations.

Section 20, subsection 10 and 11 which specify 'fish' in general terms should be altered so as to apply only to 'gaspereau or alewives.' This is necessary in view of our protective recommendations for shad and salmon.

The subsections read as follows:—

'10. Owners of land along any falls in any of the rivers of the county of Digby shall be allowed one stand for dipping fish, to be selected by the owners and pointed out to the overseer, who shall determine what claims they are entitled to, and to hold the same as their fishing privilege.

'11. When the width of any falls shall exceed twenty feet, any person, except the owner of a stand, may anchor a boat in said falls for the purpose of dipping fish. Provided that he does not interfere with the special privilege of owners of stands; and every boat so moored shall, after loading, make room and give place for others, by removing when requested to do so; and to prevent the intent of this clause from being defeated, no fish shall be salted in any such boat nor any fish shifted from one boat to another. When the river is less than twenty feet wide, no boat or craft of any kind shall be allowed to occupy any such public privilege in said river the second or any subsequent time until each man requesting the privilege shall have had his turn.'

(19)—*Shad drifting Prohibition confined to Avon River.*

In section 23, subsection 2 of the Nova Scotia regulations (p. 21) which reads as follows:—

> '2. No drifting for shad shall be allowed in the Avon river, inside of a straight line drawn from Avondale Landing to Young's wharf in Falmouth, and no drifting for shad shall be allowed above Salter's Head, in the Shubenacadie river, from the 1st day of June to the 30th day of September.'

after the words 'in Falmouth' the concluding clause, 'and no drifting for shad shall be allowed, &c.' should be omitted. Our recommendation No. 2 allows shad drifting from July 1 to August 15 in Shubenacadie river up to Shubenacadie bridge.

We have only to add that certain sections of the fishery regulations for Nova Scotia and New Brunswick are affected or in some cases would be annulled by the new regulations which we have recommended in this interim report.

(*a*) Thus section 11, clause a. p. 4 of the New Brunswick regulations which reads as follows:—

'Section 11 Shad and Gaspereau.

(*a*) The close time for shade and gaspereau shall extend from sunset on Friday evening in each week to sunrise on Monday morning following, during which time it shall be unlawful to fish for, catch or kill any shad or gaspereau. The fisheries within the harbour of St. John are, however, exempted from the foregoing provisions of this section,'

would be amended by our recommendation that the close time be Saturday evening to Monday morning.

(*b*) That section 11, clause c, establishing a close season for shad and gaspereau after June 30th is cancelled by our recommendation. It is really a useless and unnecessary prohibition.

(*c*) That section 9, ss. c. (p. 4) shall not apply to the waters of Chignecto bay, Minas basin and Cobequid bay. This subsection reads as follows:—

'(*c*) The owner or owners of any net or nets used for the purpose of taking salmon shall, on receiving such license, pay an annual license fee of three cents for each fathom of net so licensed, which license fee shall be paid to the local fishery overseer, for transmission to the Department of Marine and Fisheries.'

As a matter of fact this license has not been enforced in the waters mentioned.

(*d*) Sec. 19, subsections 3 and 4 which read as follows:—

'3. Nets for taking shad shall not exceed (except at Port Laurence) twelve fathoms in length, and the meshes of such nets shall in no case be less than four and one-half inches, extension measure.

'4. Shad shall not be fished for in any of the rivers or bays of this county, by any mode of fishing, later than the 31st day of August,'

would be amended by our recommendations which increase the size of mesh to 5 inches extension measure, and prohibit fishing after August 15.

(*e*) Sec. 24, subsections 1 and 2 would be rescinded by our recommendation for prohibiting all nets in rivers named.

The section reads as follows:—

'1. Gaspereau shall not be taken or caught in any part of the Gaspereau river, above a line between the properties of Mr. Stewart and Fredk. Annand, situated about three-quarter miles above Fuller's bridge, otherwise

than in a square net, and dipping and drifting for salmon and gaspereaux is prohibited.

'2. No square net shall be used in the Gaspereau river, or any branch or tributary thereof, of a greater size than twelve feet square, and the mesh of any seine used below Fuller bridge shall not be less than two and a half inches.'

(*f*) Sec. 24, subsection 10, Nova Scotia regulations is annulled by the prohibition of weirs which we recommend. The subsection reads as follows:—

'10. In the herring fishery of Medford and Pereaux, each brush weir shall have at least two hundred feet of seine, of not less than two inches straight mesh in the 'bunt,' to allow the small fish to escape; and no seine or weir shall be so far finished as to catch before the 1st day of May in each year.'

(*g*) We may add that while the above prohibition of weirs and seines affects certain special area and in Scott's bay, Kings county, section 24, subsection 9 (N. S. Regs.) applies prohibiting drift netting for shad inside of a straight line drawn from Cape Split to Stephen Bennett's bay, this does not interfere with set-nets of 5 inches mesh extension measure or with lines for trawl fishing.

(*h*) Finally we call attention to the fact that the Fisheries Act, chapter 45, section 19, prohibits salmon drift-netting in Canada, excepting in New Brunswick and British Columbia, but salmon have been taken by drift nets for over fifty years when drifting for shad, and it is in Nova Scotia a recognized fishery, but not licensed. This fishing it would be difficult to stop and the only feasible course is to legalize it under a permit.

The whole of which is respectfully submitted.

(Signed.)

SIMON MELANSON,
SAMUEL F. MORRISON, } *Commissioners.*

EDWARD E. PRINCE,
Chairman of the Commission.

OTTAWA, February 6, 1909.

NAMES OF WITNESSES WHO GAVE EVIDENCE.

Alley, William, Truro.
Andrews, John, Shubenacadie.
Anthony, Andrew, Maitland, N.S.
Arseneau, Dennis, Mill Creek, N.S.
Belyea, J. F., fishery overseer, St. John, N.B.
Bourke, James, St. Martins, N.B.
Burke, James, Lorang S., Minudie.
Burke, Philip, Minudie.
Burns, Melbourne, Wood Point.
Brain, Philip, Minudie.
Barker, John, Gardner's Creek, N.B.
Barnes, Willard, Wood Point.
Barnes, George, Spencer's Point, Great Village.
Barnes, Jacob, Spencer's Point, Great Village.
Bartlett, P. A., Stewiacke.
Bailey, ex-officer, W. M., Middleton, N.S.
Bentley, A. F., St. Martins, N.B.
Bishop, Adolphus, Grand Pré, N.S.
Bishop, Ainsley, Kentville, N.S.
Bishop, B. D., Canning, N. S.
Bigelow, John E., Canning, N. S.
Black, Benjamin, St. Martin's, N.B.
Brian, Lorang, Minudie, N.S.
Borden, Brenton, Avonport, N.S.
Brown, Philip, Canning, N.S.
Burgess, Frank, hatchery officer, Windsor, N.S.
Burgess, W., Canning.
Campbell, Principal, Truro, N.S.
Campbell, Hugh, Wood Point.
Card, Morton, Burlington.
Carnworth, Peter, Riverside, N.B.
Carson, Thomas, Elmsdale, N.S.
Chapman, R. A., fishery inspector, Moncton, N.B.
Chapman, S. L., Dorchester, N.B.
Clarke, Brothers, Bear River, N. S.
Conley, Robert, St. Martin's, N.B.
Cook, Rufus, Wood Point.
Coffin, George W., Canning, N. S.
Creelman, Doctor, Maitland, N. S.
Creelman, Thomas, Princeport, N.S.
Crib, E. C., Truro, N. S.
Crowe, Milton, Stewiacke, N.S.
Coulter, Oswald, Riverside, Stewiacke, N.S.
Cummings, Hon. Charles N., Folly Village, N.S.
Cotes, Charles, West Amherst, N.S.
Dalmaine, H. A., Wolfville, N. S..
Dare, Richard, Gardner's Creek, N.B.
Davison, fishery overseer, J. W., Bass River (Appendices 2 and 3).
Dawson, Reverend W., Folly Village, N.S.

Dearman, John, Maitland, N.S.
Densmore, Michael, East Noel, N.S.
Dickey, Alfred, Stewiacke, N.S.
Dodge, E. S., Middleton, N.S.
Douglas, Isaac, Maitland, N.S.
Downing, Captain W. A., Minudie.
Dobson, Frank, Dorchester, N.B.
Eaton, N. W., Canning, N.S.
Ettinger, Mackenzie, East Noel, N.S.
Evans, Robert, Lorneville, N.B.
Fay, Fred. R., Bridgetown, N.S.
Faulkner, Isaac, Princeport, N.S.
Ferguson, George, Lorneville, N.B.
Fleming, Alexander P., Folly Village, N.S.
Fleming, James, Folly Village, N.S.
Fletcher, A. B., Truro.
Fletcher, W., Riverside, N.B.
Fowler, R. E., French Village, N.B.
Fraser, John A., Folly Village, N.S.
Fryers, P. H., Moncton, N.B.
Fulmar, Burchell, Shubenacadie, N.S.
Fullarton, Alex., Grand Pré.
Fulton, Beveridge, Bass River, N.S.
Fulton, Charles, Bass River, N.S.
Fulton, Edward, Bass River, N.S.
Fulton, Rupert, Bass River, N.S.
Fulton, James A., Bass River, N.S.
Fulton, Thomas B., Bass River, N.S.
Gass, Robert, Shubenacadie, N.S.
Galbraith, Thomas, Lorneville, N.B.
Galbraith, George H., Lorneville, N.B.
Gates, H. V., Middleton, N.S.
Goodwin, D. H., Stewiacke, N.S.
Goodwin, E. K., Canso, N.S.
Gould, Captain Stewart, Great Village, N.S.
Graham, Captain John, Maitland, N.S.
Gregoire, George, Halifax, N.S.
Gwenn, Samuel, Musquash, N.B.
Harding, John, Gardner's Creek, N.B.
Harned, Andrew, Carleton, N.B.
Harris, C. P., Moncton, N.B.
Harris, O. D., Wolfville, N.S.
Harrison, J. Nictaux, N.S.
Harrison, F., Nictaux, N.S.
Henderson, J. D., Moncton.
Hennessey, Smith, Great Village, N.S.
Hill, Amos A., Great Village, N.S.
Hill, Dexter, Bass River, N.S.
Hiltz, Ephraim, Kingsport, N.S.
Holeworth, R., Shubenacadie, N.S.
Howard, John St. Martins, N.B.
Howe, Sydenham, Middleton, N.S.
Huntley, James, Scott's Bay, N.S.
Jess, David, Scott's Bay, N.S.
Johnson, George, LL.D., Wolfville, N.S.

Jones, G., Petitcodiac River, near Salisbury, N.B.
Kane, John, St. Martins, N.B.
Keillor, Ralph T., Amherst Point, N.S.
Killam, A. E., Moncton, N.B.
Kinsman, William, Kingsport, N.S.
Kirsop, George, Gardner's Creek, N.B.
Leeman, George, Truro, N.S.
Leesby, Robert, Amherst, N.S.
Lewis, George, Bass River, N.S.
Lingard, David, Tene Cape, N.S.
Lingard, John A., Tenecape, N.S.
Logan, Thomas, Elmsdale, N.S.
Main, Seymour, East Noel, N.S.
Martin, Leonard, Riverside, N. B.
MacCavour, John, Lorneville, N.B.
Maclellan, J. Gilmour, Noel, N.S.
Maclellan, S. D., K.C., &c., Truro, N.S.
Mackay, H. R., M.P.P., Lequille, N.S.
McCollough, Captain F., Walton, N.S.
McGregor, E. H., Stewiacke, N.S.
McGregor, W., Stewiacke, N.S.
McKenna, Dr., Wolfville, N.S.
McNutt, E. E., Truro, N.S.
McPhee, James, Lorneville, N.B.
McPhee, John, Shubenacadie, N.S.
Melanson, Ambrose, Pré d'en Haut, N.B.
Melanson, Simon E., Pré d'en Haut, N.B.
Miller, Jacob, Shad Creek, N.S.
Morrison, Alfred, barrister, Halifax, N.S.
Morrison, T. W., Folly Village, N.S.
Morrison, Wallace W., Economy.
Mosher, Silvius, East Noel, N.S.
Nelson, Job, Truro.
Nelson, William M., Shubenacadie, N.S.
Newton, James, Canning, N.S.
O'Brien, Adam, Noel, N.S.
O'Brien, E. A., Noel, N.S.
O'Leary, Charles, White Rock, N.S.
Paterson, James, St. John, N.B.
Pearson, Hon. B. F., Halifax, N.S.
Peckham, Captain Nelson, Wood Point, N.B.
Phinney, I. K., Middleton, N.S.
Prescott, Joseph, Bay Verte, N.B.
Prince, Fred. D., Lower Norton, N.B.
Redden, Robert, Windsor, N.S.
Redden, Ralph, Windsor, N.S.
Reid, James, Lorneville, N.B.
Reid, Reuben, fishery overseer, Lower Wolfville, N.S.
Richard, Dennis, Pré d'en Haut, N.B.
Richards, John, Elmsdale, N.S.
Rogers, Emmerson, Wood Point, N.B.
Rogers, J. M., Scott's Bay, N.S.
Roberts, Captain Alex. M., Canso, N.S.

Roy, Gaspard, Kentville, N.S.
Ruggles, H. D., Annapolis, N.S.
Shaw, Reid, Scott's Bay, N.S.
Smith, J. Nelson, Lower Coverdale, N.B.
Skillen, Squire, St. Martins, N.B.
Snowden, Luther, Wood Point, N.B.
Specht, E. P., Barton, Digby, N.S.
Spencer, John, Windsor, N.S.
Spencer, E. Fletcher, Spencer's Point, N.S.
Stackhouse, Murray, Carleton, N.B.
Starr, R. W., Wolfville, N.S.
Steaves, James A., Coverdale, N.B.
Steel, G. W., Truro, N.S.
Steel, William, Scott's Bay, N.S.
Steel, Oxley, Scott's Bay, N.S.
Stewart, G. W., Truro, N.S.
Stewart, Sargent, Folly Village, N.S.
Symes, George, Minudie.
Thomas, E. V., Middleton, N.S.
Thompson, Captain E., Economy, N.S.
Tupper, Herbert, Scott's Bay, N.S.
Urquhart, Captain W. M., Folly Village, N.S.
Urquhart, John B., Folly Village.
Urquhart, W. A., fishery officer, Folly Village.
Vance, Leander, Folly Village, N.S.
Vernon, Amos, Minudie.
Wallace, Robert, Gardner's Creek.
Warner, Ed. J., Digby, N.S.
Warner, James, Digby, N.S.
Watson, W. H., Scott's Bay.
Wells, Captain John, White Point, N.S.
Welsh, Captain J., White Head, N.S.
West, H. A., Annapolis, N.S.
White, James, Middleton, N.S.
Whitman, F. C., Annapolis Royal, N.S.
Whitman, Clem. (Messrs. A. N. Whitman & Sons), Canso, N.S.
Withrow, Wm., Newport Landing
Wood, George W., Wood Point, N.B.

LIST OF SITTINGS—1908.

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The School House, Scott's Bay, Kings County, N.S.	August	3
Oddfellows' Hall, Canning, N.S.	"	4
Board of Trade Rooms, Wolfville, N.S.	"	5
The Riley Building, Windsor, N.S.	"	6
Tenecape, N.S.	"	7
School House, East Noel.	"	8
The Public Hall, Maitland, N.S.	"	10
Shubenacadie, N.S.	"	11
Elmsdale, N.S.	"	12
Halifax, N.S.	"	13
Public Hall, Stewiacke, N.S.	"	14
Folly Village, N.S.	"	15
Great Village, N.S.	"	17
Victoria Hall, Bass River, N.S.	"	18
Custom House, Canso, N.S.	"	22
The Drill Hall, Middleton, N.S.	"	26
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Minudie, N.S.	"	2
Wood Point, N.B.	"	3
Pré d'en Haut, N.B.	"	5
Moncton, N.B.	"	6
Salisbury, N.B.	"	7
Riverside, N.B.	"	7
Hampton, N.B.	"	9
Board of Trade Rooms, St. John, N.B.	"	10
School House, Lorneville, N.B.	"	12
The Court House, Dorchester, N.B.	"	14
Gardner's Creek, N.B.	"	15
Victoria Hall, St. Martins, N.B.	"	15

PROCEEDINGS OF THE COMMISSION AND PRECIS OF EVIDENCE TAKEN AT THE PUBLIC SITTINGS OF THE COMMISSION, WITH COPIES OF DOCUMENTS AND WRITTEN TESTIMONY SUBMITTED TO THE COMMISSIONERS.

Opening Sitting.

The Court House, Digby, N.S., July 29, 1908.

Present:—

Professor Edward E. Prince, Ottawa,
S. F. Morrison, Folly Village,
Commissioners.

Professor Prince, in opening the public sessions of the commission, said:—

Gentlemen,—In commencing the proceedings of the Shad Fishery Commission appointed by the Dominion government, I feel bound to say a few words, and shall be brief, in order to make clear the objects in view and the means we propose to adopt for achieving those objects.

As most of you are aware representations have for some years been made to the Fisheries Department in Ottawa, that the shad fishery was declining and indeed in serious danger, and urging that some effective remedy should be adopted by the government. My colleague, Mr. Morrison, has been active in calling public attention to the matter, and the climax was reached when last April a memorial signed by members of the Legislative Council, members of the Provincial House, Halifax and other influential men, was sent to Ottawa, asking for an investigation as to the facts relating to the shad fishery. I met many of the gentlemen who signed the memorial in the Legislative Council Chamber, Halifax, last April and discussed the question at some length. The result is the present commission of which Mr. Morrison is a member though he had no anticipation of being a commissioner when he stirred up the matter. Great public interest has already been manifested in the commission's work which is of a very grave and important nature.

At present a weekly close time and a few subsidiary conditions are almost the only protective measures now in force. They have according to the memorial not saved the shad from depletion. An annual close season during the spawning time has been urged, but many difficulties have prevented the adoption of such a season. Shad enter fresh water only for spawning purposes and the catch might be seriously limited except for the catches of July and August shad were it possible to take none legally unless in salt water. The state of the fishery might warrant such measures, but it is for us as commissioners to receive evidence as to the facts and form our opinions and arrive at our decisions at the conclusion of our investigations.

If this commission at the end of its labours can recommend some reasonable steps to bring back the shad to something of their former abundance and thus restore a source of wealth and a supply of the finest food to the people along these Bay of Fundy shores we shall be well satisfied. We think that it can be done, but we must have the aid of the fishermen to acquire the information we desire. We want information from experienced and practical men. Laws which are based on theory or on insufficient information or worst of all on erroneous grounds must be harmful instead of beneficial. I have been asked if the evidence is to be on oath. I prefer not, we can require sworn testimony if we think that unreliable or wilfully misleading evidence is being placed before us. Personally I feel that I can trust the men a portion of whose earnings is disappearing as the shad disappears, to give us the best information they as practical men possess. Mr. Morrison agrees with me, I know, in this opinion.

Many men can recall having their first experience in a shad boat when they were very young, almost children. Many boast that their first success was gained with a shad net, and their after success in life owed something to that early fishing experience. Big catches are recorded in former times. Individual catches of 10,000 or 15,000

shad on a single tide are not known now: oftener 3 or 6 or 10 or 15 shad may be all that a man gets in a night's fishing. In many localities they are said to have become really extinct. I do not think that it is too late to take steps to restore the shad; but our present business is to gather all the information we can. The various points into which the honourable the Minister of Marine and Fisheries, Ottawa, has instructed us to inquire are set forth in the public notices, and newspaper advertisements seen, no doubt by most of those present. Over twenty public sessions have been already arranged and others will be added to our list if necessary as the Dominion government requires our investigations to be well and thoroughly done.

The valuable gaspereau, kiack or alewife and the salmon, are caught in the same Bay of Fundy waters and we can hardly dissociate these fish from our inquiries. The shad is our principal subject but we shall receive evidence upon the other fisheries for salmon and gaspereau. We invite every experienced fisherman to come forward and to tell us honestly and briefly what his knowledge and his conclusions are on the various points included in our programme of investigation. I may add that the Hon. L. P. Brodeur, the Minister of Marine and Fisheries, the Hon. W. S. Fielding, the Hon. Sir Frederick Borden, the Hon. Wm. Pugsley, Hon. Mr. Emmerson and various members of the Dominion and the Provincial Houses have taken special personal interest in the commission and its work, and are following its progress closely.

I must add one word in regard to my colleague, Mr. Morrison, though I required to say little. He has lived in a famous shad locality for a great part of his life and has often been out in the shad boat and years ago saw great quantities of shad handled. He and I have already visited some fishing grounds—the weirs in certain localities—the St. John harbour traps, and know from actual observation, some facts of vital importance in aiding us in arriving at just and wise conclusions. Mr. Morrison has for some years publicly urged that something should be done by the government which might be effective in improving the state of the shad fishery. I will now ask Mr. Morrison to add a few words before we proceed to take evidence.

Mr. Morrison said that he had long felt the necessity and importance of a thorough investigation of the shad fisheries of the Bay of Fundy, and he thought that the government never took a more commendable step than in arranging to give the fishermen the opportunity of placing their knowledge and experience before a commission authorized as his learned colleague had said to gather information so as to form a basis for legislation that may bring back the shad to something like its former abundance. As a matter of fact they were face to face with a condition. On the one hand, there were the bay shad, the summer shad, which were fat and in the best condition, then there were the spring shad, which were large and full of spawn, and practically never taken down the bay at all. There was an opinion that they were not the same species or variety; but certainly the summer shad had declined to a very serious extent, and everybody felt it. The shad were a staple food and they were the cause of a fishery which brought much money to the men resident all along the bay shores. The decline of the shad was a very serious matter to all concerned, and he hoped that great benefit would result from the commission's investigations. Personally he had not anticipated being connected with such a commission as this which the government at Ottawa had appointed. He had taken an active part in urging on the step now taken, because he thought it would lead to a great public benefit, either by the enactment of effective laws or by the erection of hatcheries for propagating the shad artificially, as had been so successfully done in the United States, or by some other measures. A conference in April last held in the Legislative Council Chamber, Halifax, which was attended by Professor Prince, and a very representative gathering met, including many members of the Council, and members of the Provincial House, and others, and the shad question was exhaustively discussed, and it was found that what the government wanted was precisely the kind of information which experienced fishermen could give, which information the sittings of the commission would, it was hoped, elicit.

EVIDENCE GIVEN BEFORE THE COMMISSION.

Professor Prince then said that as the objects of the commission had been briefly explained and Mr. Morrison had stated in what way the Dominion government had been urged to authorize the commission, evidence would now be taken:—

James Warner, the first witness examined, stated that he was a farmer and fisherman. He held the office of a fishery guardian under the Dominion fishery overseer for the district. His experience of the shad fishery extended for over 50 years. As compared with 50 years ago the fishery had greatly declined, as a trap took 50 barrels in the Deep Hole at a tide in St. Mary's bay. Those were large shad 5 pounds in weight, 14 or 15 inches long and 80 or 90 to a barrel. Earlier in the season, in May, there were plenty of spawning shad, many very large fish being taken in brush weirs. The size of shad varied, and big fish were taken in weirs, but 9-inch shad occurred in weirs and traps and even in gill nets. These small fish were thrown away, being no good for market. Three kinds of gear adopted: gill nets, which drift at night, and took great numbers of fish, brush weirs in which many early or spring shad have been taken, and seines or deep water traps, really a seine set on stakes fixed in the mud, and often 25 feet long (stakes). The pot or hunt may be 40 feet long and the wings each 120 feet long, while the mesh is small. The food of shad is small insects and eel-grass. They feed in deep water when on the mud. They enter St. Mary's bay from the open sea and migrate to the very head of the bay. Six years ago they fell off in quantity and the cause of the decline is gill-netting, breaking up the schools just as the mackerel were ruined by purse seines. Gaspereau come in at the same season as the shad, in May or June, but the weirs on shore take them all the season. They are pretty scarce now. Salmon are scarce and very rarely got in the upper portions of St. Mary's bay, that is along the 14 miles of shore of which I speak. I might say that weirs in Smith's Cove destroy quantities of small herring which are dipped out alive for purposes of compost. In one season 50 loads at least are taken at Smith's Cove. As all our local people are interested in the fisheries, we would like to see the shad back again. Everybody would.

Edward J. Warner, Digby, said he could confirm the last witness's statement, that small fish are destroyed in the Smith's Cove weirs. The fish are dipped out alive into the dories. Ten to sixteen dories may be seen loading at one time. Very few herring are seen with the gaspereau, and they could be let out by the gates, and the law provides a fine if a gate is not placed in a weir. Twenty-three years ago I fixed up a weir and attended it night and day. But they don't pay. Weirs are not placed on the places where shad resort. I took very few shad—a few now and then—but the fish were in deeper water and moved to the head of the bay. The schools kept out and were not taken in such weirs, as they were built on a point projecting in shallow water. I think sawdust is very injurious to shad. I farm as well as fish.

E. P. Specht, Barton, Digby, was the next witness and said he was a farmer as well as fisherman and did not make a business of fishing, except that he owned a small weir. He had 55 years' experience, and until eight years ago knew that shad were very abundant. Season of 1900 large catches were made, 3,000 to 5,000 on a tide. Some tides he got 2,000 to 5,000 shad some tides eight or nine years ago. By gill net the catch would be 500, 700 or 1,000, according to the net, some using a longer net. Two hundred to 300 fathoms of net were used but one net was 500 fathoms. The width or vertical depth was 2½ fathoms. Along the top of the net were floats and along the bottom were sinkers or leads. The first gill nets were brought thirty years ago by a Lubeck (Maine) man. He drifted and got so many sturgeon that he had to give up after two weeks. A Hants man came down to the bay eleven years ago with a row

boat and gill net, and about the same time John Powell from Westport came to the head of St. Mary's bay and drifted for shad. Shad usually swim high but sometimes are on the bottom. They feed on the flats on eel-grass and insects. Some think they feed on millers. The schools remain in the bay from July to September, but a late school appear which are very firm and fat, short and plump, and almost as wide as long, and they were two or four to five pounds in weight. The early roe-fish must have formerly spawned in creeks, but after June there was very little fresh water in them as compared with earlier in the spring.

(The witness here drew a sketch of the weirs in use for the commission).

The twine is 1 inch in the bunt, but the heart is 1½ inch and is heavy twine. The fishermen pull the net down by a pulley to the foot of the stakes, and they shoal up the catch by loosing the pulley. A gate is used for small fish. The gill net twine in my opinion should be 4¼ inches extension measure. Shad have declined and now only 1 to 4 or 5 shad are taken on a tide. They declined gradually hence netting cannot be the cause as Mr. Warner thought. Drifting is very limited now, but twelve years ago 100 boats were out in the bay some seasons, many from Grand Manan, &c. Mackerel are now scarcer as United States poachers came within the three mile limit. The cause of the decline of the fish may be the vast quantity of lobster traps in St. Mary's bay, though that may not be the cause. Our method of preparing shad was to cut off the head, and split the back (some split the belly) and take out the bone as far as the entrails. Then the fish was washed and scraped to get the blood away, then washed twice and placed in a tub or cask and allowed to soak in brine four hours or more. The tail remained on. They must be salted heavy. We took out the bone as they are difficult to cure with the backbone in. The men at St. John, N.B., split the back and left the backbone in, but the men of Colchester, Economy, &c., split shad up the belly. Clean salt water is the best to dress them in and for 'striking' Liverpool salt is best (in bags). The year of the big catch of shad they were so thick in the bay that they were got at the surface. Mr. Snow came from Digby with a seine and we thought they were mackerel and we found some with two dory loads and none of them knew how to split and cure shad. I told them to split and soak out the blood and they must put a covering of salt not a sprinkle. Some were not cured as I told them, and the back bone was left in, and when they were brought to Digby thirty or forty barrels spoiled. Overfishing may be the cause of the depletion, but I think the sawdust has injured the shad. The spring spawn shad in my opinion stayed in the bay after they came down and improved. I think that North and South creek in St. Mary's bay are alone suitable for restocking with shad fry.

Diagram of Weirs of Brush with 15 or 20 stakes

Second Sitting.

COURT HOUSE, ANNAPOLIS ROYAL, July 30, 1908.

After the usual opening remarks by Professor PRINCE, Chairman, and Mr. Commissioner S. F. MORRISON, evidence was taken.

F. C. WHITMAN stated he was a fish merchant in Annapolis, but the company with which he was connected did business in the provinces of Quebec, New Brunswick

and Nova Scotia and in Cape Breton. They had eighteen stations, and handled all sea fish and salmon. They had a steam trawler operating. There have been practically no shad in my day, and my evidence will be on the salmon mainly. The alewives in our rivers are earliest, and are followed by the ascending salmon. In Lequille brook alewives some years ago went ten miles up above tidewater, some miles indeed above where the salmon go, as the latter reach the Horseshoe, as it is called, five miles up, and spawn there. In the Annapolis and Bear rivers and Roundhill brook, &c., the conditions are similar. In Bear river the alewives are said to ascend a fall 12 feet high in a depth of water not more than 3 or 4 inches. Salmon were formerly very abundant, and 60 years ago they are said to have crowded up under the town bridge, Annapolis, up Carr's creek. All our local streams are similar in this, that there are still waters or lakes with sandy bottom only a few miles up, and the salmon have only a short run to get to spawning grounds. The Annapolis river salmon used to go above the still waters, but they are very early, and ascend in early March or April. They weigh from eight to twelve pounds. Roundhill brook has more salmon than any other local river. The mills are all cleared away and salmon can now get up. On Allen's brook there is a fishway at the electric light dam and the fish use it. Above are three or four dams, but all are open. Lequille river suffers from illegal fishing, as the resident Indians scoop salmon every day, as they have done for years. They scoop with nets close to the dam and a salmon rarely gets past. Scoop nets might be confined to two days per week, and it should be concurrent with Roundhill and Allen's brooks. There are eight or ten Indian families, including some from Bear river and Liverpool road, four miles from the river, and these people sell their fish in the market and get as much as 50c. per pound for it. They are very early fish, the first salmon being sold about the 4th to the 6th of April. Alewives are gone, as the dam on the Lequille stopped them, but 100 barrels used to be got, and the banks of the river were lined with people using scoop nets for alewives. On the Annapolis river herring nets are used as far up as Paradise, but between there and Bridgetown there is still water, as the tide meets there and the nets form a barrier. Below salmon can get past the nets. Tidal fishing should end at Bridgetown; it should be defined as the head of tidal waters. While the men set a salmon net, they also use a shad net mesh for salmon. Unless something is done to remove the net barrier the salmon will disappear. The fishery officer is told by the men that it is tidal water and he allows them to go on.

J. Harrison, of Nictaux, said it was desirable to take out all nets from the Nictaux river for three years, and stop all dipping, some people added; but if the nets were shortened and seasons enforced and the proper distance between nets carried out, the shad would be restored. The salmon run early, and about May 1 fly-fishing is best, and on to the 24th of May. A second run follows the May run in June. Sawdust is a trouble, as spawning trout may be seen on banks of sawdust, bubbling up poisonous gases. If the river were protected hundreds of visitors would come for salmon fishing. Netting should be confined to two days per week, and the limit for nets should be below Bridgetown.

H. D. Ruggles, Annapolis, said that he was a barrister and an officer of the People's Fish and Game Protective Association, and he fully endorsed Mr. Whitman's views. He said that the Roundhill run of salmon are known by their larger average size. He also pointed out that numbers of spent salmon are caught in a weir coming down in June and July.

H. R. MacKay, M.P.P., Lequille, said that he had lived near Lequille river for 18 years, and formerly salmon were plentiful. Indians and others got over a hundred by dipping. Alewives were abundant, but so scarce now that not a dozen had been taken

this season. One abuse was the scooping of salmon as they went up the fishway. There was so little water passing through the pockets of the fish-pass (Bower's) that this poaching was easy. A pool at the foot of the fishway should be made by deepening the waters. So far as he knew no salmon have been seen above the dam. The fishery officers don't stop scooping or watch the fishway. Weirs at the mouth of Roundhill brook should be looked into. Sawdust is not a nuisance on the rivers mentioned. Brook trout occur all the way up the river. It has been stocked by the Fisheries Department.

H. A. WEST, Annapolis, on being asked if he had evidence to offer, stated that he concurred in the statements laid before the commission. He pointed out that salmon were shipped on ice by the parties handling the fish caught locally.

(1)

Copy of letter from Magistrate F. R. Fay, Bridgetown, handed in by F. C. Whitman, Esq., Annapolis.

DEAR MR. WHITMAN,—I have your favour in *re* sitting of commission to inquire into the shad fishery, and note with pleasure that they propose extending this inquiry and will look into the salmon fishing in the Annapolis river. I certainly agree with Haggie, the Indian, who is one of the best authorities on this matter, and from my experience must come to the conclusion that the netting between this town (Bridgetown) and Paradise, the supposed head of tidal waters, is most destructive to this fish, and if, as you suggest, Bridgetown could be made the head of tidal waters, the salmon fishing for our sporting community would be greatly benefited. I will take much pleasure in assisting you in every way possible in the bringing of this scheme, and when the commission meet in this town shall certainly see it is placed before this august body. I hope Mr. Pickup may be successful in establishing a fish hatchery in Middleton, for if the spawn is damaged in transit, as you state, it is very desirable it should be done.

Yours very truly,

(Sd.) FRED. R. FAY.

(2)

Copy of letter to Mr. F. C. Whitman, Annapolis, from Mr. F. Harrison.

NICTAUX FALLS, N.S.

DEAR MR. WHITMAN,—Yours of this date. I will communicate with Lawrencetown folk. The Middleton fly fishermen are in favour of more drastic measures and propose:—

To take all nets off Annapolis river and tributaries for three years.

To stop dipping of salmon on Lequille and Roundhill brooks. Dipping is illegal, and why should it be allowed on these brooks?

I agree with the latter, but hardly with the other. To take off shad nets for three years would no doubt be the right way, but the shad fishers could not be made to see it, and I think that by shortening still further the season and also shortening the nets, and insisting on the net being set a proper distance apart, the river might get stocked again with shad. As a salmon fly fisherman I would be content to leave matters as they were, for if the shad became extinct the salmon would have a chance, as then shad nets would not be set.

Yours very truly,

F. HARRISON.

(3)

Copy of letter from Messrs. Clarke Bros., Bear River, N.S., to Mr. Whitman.

July 27, 1908.

Dear Sir,—We have your favour of the 22nd, and confirm the conversation this p.m. regarding matters referred to therein. It occurs to us that in the near future you are to have a commission meet in Annapolis in *re* shad and salmon fisheries. We are not sure of the date, but would be glad to attend that meeting if possible, but, fearing we shall be unable to do so, take this opportunity of drawing your attention to the condition of our river at this point. It is probably known to you that in the early history of this place the Bear river was one of the best salmon rivers in the province. They came up the river in great quantities and continued coming until stopped by dams, &c. Since the closing down of the mills at the head of tide water and the removal of dams in connection with these mills, there has been re-stocking with very satisfactory results. Numbers of salmon have been seen in the river and it is known that they have been seen in the lakes about the head waters of the stream some seven miles up the river. This would indicate that, with proper facilities, there would be no difficulty in having the fish frequent the streams as in former years. Our purpose in calling attention to these matters is to point out that at the present time a dam in connection with the granite works at the head of tide waters, stretches entirely across the stream, that no provision has been made for the passage of fish, and that, however many may come up the river, they are prevented from reaching the stream by the dam aforesaid.

If unable to be present, will you kindly lay this information before your commission and urge that the necessary steps be taken to provide a proper fishway for the passage of fish up and down this stream. We shall be glad to hear that you have been able to impress the commission with the necessity of action along this line, and, thanking you in anticipation,

We remain, yours very truly,

CLARKE BROS.

Third Sitting.

The Schoolhouse, Scott's Bay, King's County, August 3, 1908.

After the usual formal remarks by the chairman (Prof. Prince), and Mr. S. F. Morrison, the commission proceeded to take evidence.

James M. Rogers, Scott's Bay, was the first witness. He had lived in the locality about forty years. The fish taken are shad and herring, a few salmon, and long ago menhaden or mossbonkers which stayed only a few years and disappeared sixty years ago.

The different kinds of gear used were (1) Spring nets, which were first used here by a Halifax firm who brought sixteen boats some time before 1830. The spring net is tied down and springs up at high water. (2) Sweep seines were first used by the son of the first settler here. It was a 15 rod sweep seine and with it I helped to take 10,000 shad at one haul. (3) V-seines are set on stakes and may be half to three-quarters of a mile around. They were first set in the thirties. (4) Pound net. One was set for about three years, and a few were set down the shore towards Cape Split.

Formerly large takes of shad were secured but during the last ten years they have dwindled year by year. In 1842, there were big takes of 50,000 shad and in 1844,

55,000, and 80 barrels were taken in two nights in a weir in which there were fourteen shares. In the years 1856 to 1885, there was good average fishing; but after that, 1886 to 1896, there was a decline and in 1897. A west wind and roily water favoured good catches as when 45,000 shad were taken in one weir and divided amongst fourteen shares and 10,000 shad were left in the weir till next morning (it was on July 17, 1897). In 1842, 26,000 were taken in one weir at one tide. There were failures formerly and in 1853 and 1854 there were no fish—only about a barrel, but up the basin more were taken, not many however. With a west wind and the tide setting down the shore towards Cape Split, the shad came along the north shore into the bay and good catches were certain; but if the water was not roily the shad would not be taken in quantity. Shad seines are set about the first Monday after June 20 or about July 1, as not many shad are moving in June or in August or September. Once on the 10th of September, I knew of a good haul of 15,000 shad on the south side. The River Habitant people sixty years ago used to come over here after their own fishing was over and set nets here in September. The shad came in for food, viz., a marsh flea with which the water was alive. They were of a light brown transparent colour, and an inch long. Many shad have been opened but the stomach contents could not be decided. Spawn shad come only occasionally; not one in a thousand is a spawn shad. They spawn elsewhere and come here to feed up. Eighty filled a barrel in early days of course salted and weighing 200 pounds. I once got a prize for a barrel (1st prize) and it contained 62 shad. Shad of three or four sizes occur. In 1897, as good shad were taken as ever before. The seine mesh was 4-inch extension now 5-inch mesh is used and 7 or 8-inch in the inner net. The smaller shad as big as my hand are sold for No. 3's. None are composted, but herring and mossbonkers are. We see only few sick or poor, spawn shad. Late in the season dog-fish occur and often very thick but very few in recent years. Formerly sawdust was deposited but most mills usually took care of it. The water is often full of sawdust from the mills between Eatonville and Parrsboro', but shad are not checked, their feed is killed off, it is death to all vegetable and animal life. Injury is serious from the catching of spawn shad in the Annapolis river and other rivers. A few salmon are always taken with a west wind especially but none in clear weather. Our seines are too low for salmon. Five or six may be taken. Also a few gaspereau—a basketful early in the season.

William Steel, Scott's Bay, whose experience extends over sixty years stated that he was a fisherman and also a farmer. He remembered poor years in the forties when 400 or 500 shad only would be taken on a tide. Ten or eleven years ago there was a serious decline. The smallest size shad I ever saw in the bay was six or eight inches long. A seine takes eighteen or nineteen men two weeks work fixing up and it costs from $800 to $900. We pay 25 cents per pound for the twine and use twenty pounds or more. The stakes we procure close by here. There are eighteen or nineteen shares in a seine. Storms often wreck our seines twice in the season. We used to get a few sharks, but we may get a few mackerel, also flat-fish, skate, and small fish which can be liberated by lifting a few inches of the seine. Very rarely there are late shad in September, but by August 20, storms stop seine fishing. Formerly we sold salt shad to customers who came from the surrounding country with teams. No vessels shipped out shad except very occasionally. Now shad are all sold fresh. We split them in the back for salting, scraped the blood out, scraped off the scales before salting. Scott's bay shad had a superior repute because they were scaled. The scales were off and they were gutted. No great loss would occur to any one if the shad fishing were forbidden: but stop the catching of spring spawning shad or build hatcheries. Make a close season for spawning shad. We catch the spawned shad that are feeding up. We get a few cod fish but very few of us are fitted out for cod fishing.

David Jess, Scott's Bay, said that he had 60 years' experience, and he stated that shad had seriously declined. Years back they had been scarce, and 31 or 32 years

ago there were very few shad. One poor year now and again probably the fish had turned some other way. For some years after 1884 there were poor seasons but in 1896-7 big catches were made. Next year, 1898, was very good, but not so many fish. We use 5-inch mesh, extension measure. The reason is that there is no use in fishing with it small, and it costs a little less. The decline is due to the destruction of spawn shad. No spawning places occur near here. We take few small. A few like a large herring, some one-third grown and some one-half grown. When the mill operated here sawdust did not keep the shad away, they came in just as plentifully as usual, and none were ever found dead. A close time would be serious for no one. Spawn shad go into the garbage heap if caught, they are so poor. Hatcheries have improved the supply of salmon they are more plentiful than 20 or 30 years ago.

Herbert Tupper, Scott's Bay, stated that his experience covered 50 years. Sawdust is an injury to any fishery. All round the Bay of Fundy shores sawdust has been harmful, it lies on the flats and they are black with it when it decays. We caught plenty of shad, yet always thought it an injury, and found it covering the food with a scum. The food is a worm or flea. I know of one man who angled for shad successfully, but did not know the bait he used. 1872-3 was a big year, when 100,000 shad were stopped in three seines. A vessel load of salt was available, and the catch was salted in puncheons and re-packed in barrels. Formerly always packed in barrels. The remedy for the present scarcity is to stop the destruction of female shad. Three or four years ago good farmers would feel around to catch a few shad from Bridgetown to the headwaters where the Annapolis river is nothing but a brook. It was the same on the Shubenacadie river. In St. John river tens of thousands of shad largely spawn; shad are taken in drift nets, &c., which are very thick in the St. John harbour, and that is a grave danger. I saw them about the last of May. It would be a money gain if we stopped and stored our seines. The value of salmon catches we make amounts to nothing, but it would be serious for the weirs. After June 10 shad are seldom taken in salmon weirs.

Oxley Steel, Scott's Bay, said he farmed and fished, and had known the shad fishery for 20 years. The seine takes 18 to 40 pounds of twine for each share per year at 25c. per pound. It costs, say 15c. per pound, for knitting, and it is tarred with pine tar. We use 18 thread cotton twine. We used to buy in Halifax, but lately got twine in Boston already knitted. In the seine is an inner net in the bunt 5-inch mesh, whereas the outer net is 2-inch mesh and is four feet high. We use stakes 17 to 24 feet long and 4 inches diameter at the butt. We drive in a 7-foot hub of small stakes which are shorter and make a hole alongside and tie the long stakes in and leave the hub or short ones in. We take the long stakes out. The decline is due to spawn shad being caught in the rivers. Sewage and sawdust pollutions had done harm. Shad are so scarce they bring 25c. each, whereas formerly they were 5c. each. The witness added that a large weir would cost $1,200.

W. H. Watson, Scott's Bay, said he was born here, but had spent 18 years in the United States. The shad fishery was a big industry when he went away, but had declined when he returned in 1898. No cause that he could see. Sawdust is no hurt, as salmon are more plentiful. Herring, too, have dropped off, but cod and pollack as plentiful as ever. In Massachusetts, Connecticut and Maine spawn shad are not seen, and no fat shad. He farms as well as fishes, and has a share in two seines. He tried to find out the food of the shad. It is something like sand fleas. Shad 'sign' is seen as a slimy deposit where the shad fleas have been down at the foot of the beach. Shad are then around. Man causes destruction of the mother shad, and hatcheries are the best remedy. Weirmen rarely see shad fry in the seines, and as weirs have gates, small fish go through.

James Huntley had 50 years' experience, and noticed the decline in the shad during the last 10 years. Food is as plentiful as ever, and sawdust has no serious effect. Stop the taking of spawn shad and build hatcheries. The stoppage of the shad fishery for a few seasons would not be serious. I farm as well as fish.

Reid Shaw engaged for 45 years in shad fishing, beginning when 15 years old. He farms, and has share in two seines, bringing $10 to $30 a season. We have no license, but hold our rights by possession. We have fished at a loss for 11 years, *i.e.*, we do not clear more than $10 after paying expenses. We used to clear $500. A close season is necessary for the fish on the spawning grounds.

Fourth Sitting.

Oddfellows' Hall, Canning,
August 4, 1908.

There was a large attendance of fishermen and the public when Professor Prince formally opened the sitting, followed by Mr. Commissioner S. F. Morrison.

William Kinsman, Kingsport, was the first witness, and stated that he fished and farmed. He began at Mill Creek, called Blomidon P.O. That was 69 years ago. His father had fished herring in a brush weir, and occasionally got shad. It was rocky ground and shad avoided it. After moving to Kingsport he had a share in one of the two weirs at Habitants river. There were 38 shares, each worth $100. It was the upper weir and went to high water. It was a seine tied to stakes and at high water they went out in a boat and cut the twine when up came the seine. They took it out at two tides (two springs) in a week. About 1838, so great a school of herring came against the seine and collected there that the river was dammed completely. We caught no shad at Medford. Even when our take was 400 bushels we got no shad mixed with the herring as they swim over the mud flats. A few years after that some Newfoundlanders came and used drift nets and fixed a pound net at the mouth of River Habitants. Next year they were seized. The Kings and Hants men then went into drifting, and they would load their boats. Shad then declined in number and size, and finally they gave it up. That was 30 or 40 years since. In 1896 I fished a seine with Mr. Hills for three years, and one year we got 150 barrels of shad, but they got scarce and drifting ceased to pay. The size of the fish kept up and improved under drifting. The fish came in July and left the latter end of August. They lasted two months, the hottest months of the year. There were a few in June. The shad were big fat fish with no spawn in them. The spawning had passed. They moved up and down on the flats feeding there. In 1896 shad struck into St. Mary's bay. We went there, using St. John shad nets, and so many nets were in the water that the fish were cleaned out in a night, the water being shoal. We thought the school came from Mexico, and the southern United States coasts, and after spawning had travelled north. The causes of the scarcity of shad seem to be due to: 1. Drift nets which drive them away as they are not in the great ocean but in limited waters. The government should not have allowed continuous drifting. 2. Breeding shad are destroyed in St. John river. They are very poor and not worth eating. We must have conjoint action with the United States as they have more breeding shad than occur in our waters. 3. Shad can't get over mill dams and fish-ways are not provided. As there are not many seines, they cannot be the cause of the decline. We got small shad in seines, and once in a while a salmon. I had my seine at Borden's wharf and

another at the river mouth was also fished. We gave up our seine for three years because of the injury due to drift nets. At Kingsport, Bishop fished for two or three years and then gave up and Mr. Hills and I fished in 1893-4-5. Ever since the St. John men came here the shad have grown less. I was a boy when they came. At Scott's bay such catches were made that everybody went there to take care of the shad. The whole country side turned out to help and salt them. The price of salt shad in 1838 was $2 and $2.50 per barrel and they were sold around the country, the only towns to which any were shipped were Halifax and St. John. The price has now risen to $10 per half barrel.

Phillip Brown, Canning, said he was born in 1830, and when he was 26 years of age there were nothing but brush weirs off Blomidon shore. Our catches were herring and as they got scarce we got seines. The stakes were 8 feet long, 3 feet being in the mud. Fat herring were so plentiful that we would often lift the stakes and liberate them. They were taken out by cart-loads. About the last of April we got one or two spawning shad in a season. Seines seldom took a shad, one now and then, but very poor in condition. Shad were big then, 80 filled a barrel and 100 No. 1's at that time filled a barrel. I never saw shad fry. We often found herring get through the brush. When the St. John (Halliday's) schooner came and lay off Perean at anchor I lived there. They had eight or nine boats and they would drift down and go aboard to clean the fish. They got lots of shad and cured on board. They set seines on stakes they had cut, and ever since they fished the shad decreased. That was in 1868 or earlier. But we could always get a fresh shad somewhere until this year. I have heard of 500 barrels of spawning shad taken near St. John river, and the cause of the decrease is this killing of spawn shad. Remove the cause and let the shad spawn. In Scott's bay no shad are caught if the water is clear. Weirs do no hurt here. The same applies to herring. From Scott's bay to Cape Split they are spawning on that shore. I remember three vessels from St. John loading up, salting and filling the hold for St. John. I have fished at Whitechurch brook and the weirs never stopped the herring a bit. Leaving the weirs in after the fishing with cart-loads of dead and decayed herring is bad, and they should be taken up not later than the middle of July in this locality. Later would do in Scott's bay.

Ephraim Hiltz, Kingsport, said that 15 years ago he commenced seine fishing. Had fished before in Halifax county. Shad were formerly more plentiful and he had heard old men say that earlier still they were even more abundant. He got in his first year (1893) 200 half-barrels of salt shad, perhaps more. We sold some fresh. Three of us joined in the catch. Our second year was not so good; but the third was best of all, besides fresh shad we had 125 half-barrels. Shad seines were everywhere 4-inch mesh. A second net (herring net) was often hung outside 2½-inch mesh. A small seine 3,000 feet long cost $200. The seine on Starr's flats probably cost $400. We bought Halifax twine, 18 thread cotton the size of salmon twine. I tanned my twine, some use tar and some raw tar. The wing that crosses the tide requires renewal every year. You can't clean it of moss. I have seen small shad running with large shad. They were as small as gaspereau, especially if shad were in quantity. The largest shad are 9 pounds, only one or two in a season; we called them King shad. I have seen them with a little spawn, they were large fish, very poor. Annapolis and Nictaux rivers have spawning places. Shad feed on gray worms on the flats. They are jointed and you see the marks of the shad's nose in the mud. There is no scarcity of feed. Stop spawning shad being taken. Shad are over by August 15, but we fish seines till then, and commence the last week in June. We have no loss from storms up here, but in the bay there is loss. We like a S. or S.W. wind or a S.E. is good as it is an on-shore wind. Shad are windward fish. We got $5 per half-barrel No. 1's 15 years ago; but last year (1907) I got $10. Our trap or seine is small and catches are not very big. I got three shad and one salmon this year.

JOHN E. BIGELOW, CANNING, said that shad ascended clear up to the dam three-quarters of a mile up the river in July and August. In Gaspereau river, gaspereau were got in the shad seine: hundreds of barrels. The river here was alive with shad: their backs could be seen out of the water; but shipbuilding spoiled the fishing because of the sawdust. I think the feeding grounds are just as good as ever and not damaged by sawdust. I don't think that drift nets killed the fishing. There are not half the ships here now that there used to be. The shad caught at Bridgetown in May are not good. Formerly the shad men could not take care of their big catches and had to let some go adrift. In 1865-68, I have known 30,000 to 40,000 taken at a tide, but 8,000 or 10,000 was more usual, and never more than three or four spawners at times. Shad have declined gradually but there are not so many weirs for shad as there used to be.

JAMES NEWTON stated that shad came up to the old wharf where a seine was and a mile below was a seine.

N. W. EATON, CANNING, said I have bought shad for thirty years. In 1876, there were a good many shad and in 1896 the decline began: 10 to 50 barrels or packages during the last ten years per season. I have handled 300 shad this year and I handle the major part of the local catch. It was three barrels and fifteen packages (i.e., half-barrels) of salt shad. The price twenty years ago was $4 or $5 per half-barrel, but $8 to $10 per half-barrel for the last five years. The quantity has fallen off, but the quality and size have not declined. Not many small shad ever brought to me. The remedy is the prohibition of catching spawning shad. At Scott's bay, a limit in fishing already is carried out, viz., the prohibition there of drift nets.

S. BURGESS, CANNING, when a youth eighteen years old remembered shad as plentiful. That was fifty years ago. A barrel of No. 1's brought $8, later the price rose to $10. The Scott's bay shad considered better than river shad: no fresh water being there in the bay and they were bigger and heavier. The trouble is due to drift netting and taking of spawn fish.

George W. Coffin said that in the summer of 1872, a New Brunswick schooner was brought to this shore by Captain Stoddart, with a few boats and fished with lines for cod in Minas Basin and drifted for shad at night.

B. D. BISHOP, CANNING, stated that he was a farmer, but for six or seven years had done some fishing. He had fished before but quit twenty years ago. The shad had diminished then. He fished at Kingsport and had a share in a set seine. It was to the south of Kingsport near the river channel. Hiltz bought us out. We took shad, now and then a salmon, also cod and haddock and a lot of rough fish and a lot of sturgeon. The last were six to seven feet long and we fed the hogs on them. We got various sizes of shad, but the larger the catch the better the fish were, and a poor catch meant small fish—No. 2's and No. 3's. Small fish or fry seen; but we did not think they were shad. If you ascertain where the shad spawn you would get to the root of the trouble. Long ago the New Brunswick people spoke to me of the spawn shad caught early in the season. Long ago a law was made to prohibit drifting all around here.

Fifth Sitting.

BOARD OF TRADE ROOMS,
WOLFVILLE, N.S., Aug. 5, 1908.

There was a numerous attendance of fishermen and the public when Professor Prince opened the proceedings at 10 a.m., followed by some introductory remarks by Mr. Commissioner Morrison.

ADOLPHUS BISHOP, Grand Pré, stated that he had fished shad from the age of 16 and he was now 80 years old. Sixty-seven years ago, when he was 12, he remembered the first weir made of brush at Ellison Point, near Starr's Point. The owner caught more shad than he could use, as much as two yoke of oxen could draw. There were big seines, drift nets, polly nets, &c. There were four seines at Fort Islands, Boot Island, &c. Big fisheries were at al lthese places. Everybody caught hundreds and thousands of shad, but large numbers were small. (*i.e.*, No. 3's.) There were nine gill nets or drift net boats. Small shad were dressed like gaspereau, the head being cut off and the fish gutted. Shad were split through the back. Only one in a thousand had spawn in them. The fishery began from the 15th to 20th of June. He remembered getting 2,000 one night, about the last of June. They were very abundant and we could see their fins all out of the water as far up as two miles from Canseau—that is on the Cornwallis. One man got 1,000 in a little seine alongside the Canard river. The drift net let No. 3's through, taking only No. 1's and 2's, being 4 or 4½-inch mesh or larger. Drift nets always had larger mesh. There has been a marked falling off during the last few years but No. 1 and 2 fish, not No. 3's, have been the main catch in the set seines, of which the mesh is 4 or 4½-inch mesh (2 or 2¼ bar). Early in April the shad spawn; they are found in the Annapolis river. In April my mother used to have fresh shad always on the table in April, and one friend I remember said when he was in Halifax on Easter Sunday he had fresh shad for dinner. These fish appearing so early could not have migrated from the south, as some think. The schools were caught early, 200 or 300 in one night, and sold throughout the province year after year. Some were sent to the States. I have seen small shad, 4 to 6 inches long, and such small fish must be native to our waters. One hundred No. 1 shad should fill a barrel; but I have seen 75 or 80 fill a barrel. The price was formerely $6 per barrel or $5 per 100, but $4.80 is got for a quarter-barrel, and I paid $10 for half a barrel recently to send to my son. The size has not diminished; indeed at Boot Island last summer (1907) I got a barrel, and it contained 16 fish only, they were so large. The food, some say, is sedge; others say snails, but the food is not hurt by sawdust. Over-fishing is one cause, too many seines being set. Also small shad were destroyed. The number of fishing stations should be curtailed and more rigorous inspection and patrol. An officer should be on duty every night. Also the taking of spawn shad should be stopped. They are in demand, and in Chicago I have paid 50c. for a roe shad. When I was fishery officer I had charge of Gaspereau river, and got a Roger's fish-pass put in at White Rock. The fish went up in such numbers they jammed in the buckets or compartments of the pass. Fish get up by an ordinary pass, but a man had to watch it night and day when the fish were running. The three dams on the river were taken out. As to the gaspereau it is a more persistent fish than a salmon, as the salmon must have a clear run. The gaspereau went into the remote lakes to spawn. In September the young are 3 inches in length. Salmon have improved during the last two or three years in Gaspereau river. Planting of hatchery fry has been carried on for eight or ten years.

The salmon are not large, 7 to 10 pounds, but at Hall's harbour the salmon belong to heavier rivers; they are large fish. I saw King's county salmon in Halifax, which I knew was from Horton township, Kentville. I knew them at once.

Fishery Overseer Reuben Reid, Lower Wolfville, said that the fish in the locality were gaspereau, salmon, sea trout, fresh-water trout, and smelts. There were no shad, only now and then. The square net is mainly used. Gaspereau go up 15 or 20 miles, say from May 10 to June 10. They take five to six days going up if weather be warm as there is no hindrance. They ascend more quickly later. Young fry two inches long are seen in millions at the last of August and eel-pots destroy them. Dams are no obstacle as if not too high they will come over all right. The dams on the Gaspereau river were too high (10 or 12 feet high), so we put sluices so as to let the young down. Fifty years ago they were not more plentiful than last year. Salmon fly-fishing was not so good as usual. The usual weight is 5 to 12 pounds, but occasionally a salmon of 15 to 20 pounds is caught. They come in in spring—May or June and then in the fall—October and November. The two runs cannot be distinguished. Mr. Nathan Benjamin said he never got a spring salmon with spawn in it; but one he opened when the snow was on the ground was full of spawn, and on November 1, thirteen salmon were seen under the bridge. There is a close season, June 10 to April 1 following, for gaspereau and salmon when the square nets are to be taken out of the river. Fish nets can be put in and taken out in spite of the officers. Four dams have been built on the Gaspereau—three above White Rock are without fish ladders. The first is open. Last year it stopped gaspereau and we cut a place round one to let the fish go up. The second was open in the centre and the third was open. All have stone in them and the fish have been blocked. They are of no use and except for driving they are unnecessary. The Dodge dam and the Redden dam are open to let young fish down. I have known two-year old gaspereau 'shiners' taken in shad seines after leaving the river. Salmon fry from Bedford and Windsor hatcheries have been planted in the Gaspereau river, but I do not think it would ever be a great angling river.

Charles O'Leary, White Rock, Gaspereau River, said that for 34 years he had been a guide and knew the river well. Thirty years ago fish got up but for the last two years dams had blocked them worse than ever, and fly fishing has fallen off. Angling would bring a lot of money if anglers could get sport. Gaspereau river is the equal of any Labrador or Newfoundland salmon rivers. The pools are easy to get at, flies are never so bad as in the north, and the salmon are gamier than any others. Ten or twelve sportsmen might come where one comes now. Fish from 16 pounds down to 6½ pounds are taken with fly, but I have heard of one 20 pounds taken on the river by a net. Some fine pools occur 14 miles from the mouth which are well wooded on the banks and secluded. Some salmon come in May, about the 1st, sometimes the 10th, but the middle of July they won't take the fly. I found in a fishing camp that two salmon had been taken in an eel-pot. It was in October and the fish were full of spawn. There should be proper protection against such abuses. Salmon taken by local people bring $1 to $1.50, whereas to the angler every salmon costs him $1 to $2 per pound. One fish taken by an angler is worth ten taken by poaching. Mr. Reuben Reid's suggestion is a good one to remove the barrier arrangement, a triangular arrangement left in to make an eddy below the nets, and ensure capture of ascending salmon. These arrangements should be all cleared away. We see no grilse in our river, but lots of fry often confused with salmon trout fry, and wantonly taken by boys. Occasionally we see a smelt. There are more gaspereau now ascending the Gaspereau river than for several years. I bought 250 barrels, salted, of Griffin and Hunter, and probably as many gaspereau were sold or used fresh. I saw young gaspereau two weeks ago (July 22) going down, but usually they run in August till August 15. They were early this year. Since salmon fry have been planted we have got

a different salmon. It is not like our Gaspereau river salmon, its game qualities are different. They are inferior in fight, take the fly with less vim, and the colour of the flesh is not so good as our fish. I would urge that spawn be secured from our own fish for stocking the river.

Dr. McKenna, Wolfville, stated that he had known the Gaspereau river for 13 years. It was a good angling river—indeed first class as compared with other salmon rivers. The season begins May 10 and lasts along into June, about the last of June. Fish once were numerous but have seriously declined so that there is not now the same amount of sport as formerly. I have not seen any poaching, but it is said to be carried on. Indeed I have myself heard shouting when on the river at early morning, and I have bought salmon which had not been hooked but either speared or gaffed. There are stone obstructions built to turn the ascending salmon from their upward course. Dams too have been a great injury. The doctor here produced a document written by a prominent gentleman who knew the river intimately. Some of the details were questioned but the following summary will indicate its contents:—There are eight obstructions on the Gaspereau river. 1. A stone wall opposite Andrew Westcott's above the Simson bridge. It obstructs fish except at a few tides (new and full moon). The square net close by set for alewives takes nearly all the salmon passing up. 2. Two miles above the Westcott obstruction a stone erection is built across the main current to turn the salmon up a small stream leading to Hunter's mill. Few can escape. 3. Just above Gaspereau Bridge near the village, a square net is placed obstructing the whole current as the river is very narrow. No fish pass this unless the water is high. 4. At Jedrey's mill, a fish pass really a death trap is constructed and is watched day and night so that a salmon rarely gets through it. 5. One and a half miles above Jedrey's is another stone barrier and square net. 6. Another wall and square net less than two miles above No. 5. 7. About one and a half miles above No. 6 is Nieley's (Kneeland's) dam across the river and no fishway. 8. Lane's mill dam without fish ladder. The very few salmon that do pass up, alone keep up the supply (apart from hatchery fry) and extermination threatens. The law is right enforce it. On the Annapolis river the efforts of the fishery officer E. S. Dodge, have saved the fish as obstructions have been removed when nearing extermination. Salmon are becoming more plentiful in consequence.

Alexander Fullerton, Grand Pré, farmer, said he first fished shad 47 years ago. He used drift nets from a yacht, going out at high water at dark and fished on the ebb tide, sometimes using 200 fathoms of a mesh of 4½ inches, but we enlarged our mesh to 4¾ inches to let some, small, get through. The depth was 12 feet and it had floats and sinkers. There were ten or twelve boats and we always went up to put in our nets and drift down. At a good tide, a high tide, we went off Blomidon. Sometimes we would drift back by early morning, or else take out our net. No shad were taken in the day time by drifting in clear water. I can't see that the seine man can be right as to the damage being due to drifting. We got sizeable shad, No. 2's and No. 1's. They come in on the flood tide and feed on the bottom, on the flats. But they also feed at the top as shad are gilled near the rope. We once tried a shoal net not more than 5 feet deep, the outer end being on the sedge flats and at ebb we got it full of shad. I have seined and drifted and gave up the latter. The size of fish varied: but every small fish would go through. I caught spawn shad more plentifully as I went out. We seined about the middle of June and got them, perhaps a bushel basketful, 200 shad. The eggs were well developed. Up Stewiacke river, I saw men taking shad the last of June, and all were spawn shad on their way to Grand lake. As to the remedies I say 'close down' as men are losing money and time putting up seines. Or cut down the seines in length. They made big catches and I could have let some out, but left them in and pollution and waste was the result. I know from experience for I seined on Long island near Boot island and gave up ten years ago.

The seine catches off the family and exterminates whole schools. We get young fish especially small gaspereau and shad and used them for compost, when we used brush but the net seine on stakes let the small out. Sawdust is injurious. It floats everywhere, you can hardly water a horse in some streams and it is deposited on the flats. It forms bars of decayed material.

R. W. STARR, WOLFVILLE, held that the Dominion should try to come to some arrangement with the United States government as the destruction of spawn fish in the Hudson river, United States, the Annapolis, St. John river, &c., is very serious. I never knew of any spawning shad in the rivers of Minas Basin, but perhaps too much gear has been put into the water. For two seasons a United States fisherman fished shad here with a vessel and eight or ten boats. I hand in a written paper as I feared that I might not be present at the sitting. The written statement runs as follows:—

'I have heard my grandfather, Joseph Starr, tell of taking 1,000 shad at one time out of a weir across Shad creek which was only as high as the marsh. At that time about 1790, it was thought remarkable. This small fishery was kept up for many years giving a supply for one or two families. Some net was added above the weir and continued on each side of the creek.

Somewhere about 1835 a large spring seine was thrown across Canard river near its mouth. This was very successful for several years and took some large hauls of shad, and several haddock and cod. Later menhaden and dog-fish invaded the river and owing to expense it was abandoned, and the fishery on the Cornwallis was again taken up. A stake net 300 or 400 yards long was thrown across False channel below the junction with Shad creek. This was very successful, and for several years the net was added to, then it was moved further down to Clan creek for two or three years with varying success. Moved to the flats of Canard river north of Star's Point, it was enlarged and was very successful in its new position. Another company took the old ground on Clan creek with fair success for several years. These nets were fished every tide from the shore by flat punts drawn by a horse. Another seine on a middle ground near the channel of Cornwallis river was also fished by boats. In 1861 the Starrs put in a large stake net on the point of flats between Canard and Cornwallis rivers. It was 10 feet deep and nearly one mile long, and for 8 or 10 years was very successful. Meantime the other stands began to fail and be abandoned, and ours declining and other business pressing, we sold our rights and nets to another company who have continued the fishery to this day. During this time drift nets took large quantities of shad. The men went out with the tide and returned on the flood. No question over-fishing had much to do with the decline; but the main cause in my opinion is the almost total destruction of the spawn fish on all the large rivers from the Hudson to the St. John. Even the Annapolis is fished from Goat island to Aylesford during the spawning season, so that few escape. Minas basin is simply a feeding ground for the young and non-breeding fish. Very few spawn fish are ever taken here in nets and seldom if ever found in any of our fresh-water rivers.

BRENTON BORDEN, AVONPORT, said: I put in seine for cod in early spring and fish till June 20 on Avonport flats where the Gaspereau is W. by S.W. and the Avon S. I get very few small shad, not more than a dozen amongst the gaspereau No. 3's. In May, this year, I got a 4 pound spawn shad. The last of the spawn shad occur about June 1. I think they are southern shad spawning in United States rivers, and they come here to feed. These large fat shad come here about June 15 in good condition, and last till July 1 to 7. Formerly they were here in July and August to September 15. But now they are gone by August 15 at the latest. They are 3 or 4 pounds, even 6 pounds at times. I don't think the spawn shad went up here to spawn: the flats are full of insect life which attract them. As to shutting down all seines, they will soon shut themselves down. Cod fishing alone would not pay, we must have other fish as well, and we get a few shad, striped bass and salmon, and so we keep up

our seine. I get 50 or 60 cod per day, *i.e.*, 10 to 30 pounds, rarely 40 or 50 pounds. Very early in May we see spawn in the shad, but in May it is all done. Remove all obstructions in rivers and build artificial hatching stations. I farm and the fishing is only a side show with me.

H. A. Dalmaine, Wolfville: I have known the Gaspereau river for 20 years. Salmon are seined, dipped, and I have heard are dynamited, and there are many fishing grounds on the river, all destroying ascending fish. Were salmon allowed to ascend, the river would improve. They are taken at the tail of mill races, and I have prosecuted men for poaching them there. These artificial channels and mill races should be fenced off and the salmon kept in the main river. Every device is built to turn the fish out of the channel. Every net has a fike or a place for one.

Ainsley Bishop said he lived two miles out of Kentville and farmed as well as fished. As to the size of shad I took thirty and they weighed 90 pounds cleaned. That was my catch this season. Four or five years ago I got one of nine pounds and five and six pound fish are common. Fishing stations have fallen off. Off Starr's Point I used to count five or six fisheries, now there is only one left. The fishing did not pay, shad fell off so. We seldom get gaspereau; but we have no herring net around the bunt as some have. Small fish escape. I have seen small gaspereau go through a four or four inch mesh and there must be great quantities escaping as the tide ebbs. My weir is fully half a mile long. The spawn shad have been destroyed it is hard to see how any get up as one man has a dozen nets. There are 200 nets taking spawn shad in the Annapolis river. This year is the worst we ever had and I speak practically from fifty years experience for my father fished before me and I heard much from him. We got fine hauls ten or twelve years ago, there was no anxiety. In the eighties we used to take 2,000 or 3,000 shad. But now my catch has ranged from sixty down to one. Closing down the shad fishing totally would not help at all as only one stand is fished to four or five formerly. It is the cod which enables us to make it pay. Occasionally we get a salmon. Shad don't spawn in our area, but United States rivers affect our fisheries as the fish migrate up here from the south.

Gaspard Roy, Kentville, said his experience was about 30 years. He was interested in three fisheries, but only one was fished for several seasons. Early in the season we get cod and later about June 25 we get shad, also quite a few bass, some thirty pounds weight. We get a halibut rarely, one a year and small in size. We are near Gaspereau river and a few barrels of gaspereau, three or four. Perhaps ten or twelve salmon in a season. Our shad are fat with small roe, about 5 inches long and 1 inch in width. The September shad are the best, but have dropped off in recent years. We have got 500 or 600 at a tide, very fat and the roes 5 inch long and 2 inch wide. Ours are fat fish with very small head. One should be sent with a sample of the roe or spawn to the United States as I think that they must spawn somewhere in January or February. The marking of shad and recording their liberation and recapture would be a sure way of telling where they spawn.

O. D. Harris said that roe shad occurred April 15 or thereabout. In North Carolina, roe shad were high in price, viz., 75 cents even for a male or milt shad and $1 for a roe or female shad. I saw at Middleton, shad which had not spawned by May 8 and on May 10, I saw thirteen shad which had been caught in the Annapolis river, two were males and the rest were female or roe shad. They were in Charlton's market.

Dr. George Johnson, LL.D., F.S.S., &c., ex-Dominion statistician, said Kings county produced in 1860, according to the census of that date, 1,228 barrels of shad whereas in 1906, it produced only 194 barrels valued at $4,000. In Scott's bay when I was a boy the takes of shad were surprisingly large; but many causes may have

helped to bring about the decrease especially perhaps the cutting down of the forests, causing more soil to be carried down in suspension in the water, i.e., more poisonous material than formerly and affecting such favourite shad resorts as Scott's bay.

Sixth Sitting.

Riley Building, Windsor, N.S., Aug. 6, 1908.

On the sitting being opened by the Commissioner, Professor Prince, and Mr. S. F. Morrison evidence was taken.

Morton Card, Burlington, said that he had fished for 26 years and farmed. Shad, salmon, cod, gaspereau, &c., were the fish he took. When he began fishing was good and 200 to 300 shad were caught in a night by a man. It was all right then. The fishing lasted from June 20 to September 1. After three good years fishing fell off. The No. 1 shad were three pounds weight cleaned, and very few No. 2's were taken. They were fine and fat, and few spawn fish occurred, not one in a thousand. Whether the shad were coming in from the sea or out it is difficult to to say, though I have got them far out coming in. We take shad on the ebb tide, as they mostly stem the tide. We used gill nets 60 or 70 fathoms long, in some cases 150 fathoms might be used. About 100 fathoms to a boat was common, the boat being 16 to 18 feet long. The mesh was 4¾ inches to 5¼ inches, and was Knox's Scotch twine No. 40 and 3, twine bought from W. H. Thorne, St. John. We got no small fish, and if there were any they must have passed through the mesh. We fished from Windsor to Blomidon. The fish came in to feed. The food is scum or suction. Sawdust does harm, and the poor shad we see are the effect of sawdust. I live a mile from Kennetcook river, and at low water I see the beach lined with sawdust. The nearest mill is nine miles off, hence it floats a long way and lodges in the gills, but chiefly it is in the stomach. Seines are injurious. They are two miles long at Boot Island, and I have found a thousand small 4 inches and up for 100 mature shad. I heard that shad have been used for compost. This season I got only 25 shad and about 12 salmon, weighing 5 pounds a piece on an average. The price for shad is $10 per 100 generally. There has been no decrease in the size of shad. I have occasionally seen a spawn shad, but our gaspereau nets usual early were too small to take them. I think spawn shad are a different species from summer shad. The shape is the same, but they are larger, and of course may be the same species. I think the same shad return for several years in succession. About three weeks after they get shad at St. John we get them here. The spawn shad come in May, but we never get any here of those. Stop the taking of spawn shad. The sawdust abuse and set nets should be remedied in order to improve shad fishing. I have not fished gaspereau nets, 3½-inch mesh, for two or three years. These drift nets were used from April 20 to June 1. I think there was a good run this year. The alewife is not the same fish as the gaspereau, though they herd together. The alewife is a little larger, and has black spots, same as shad, and resembles the shad more than the gaspereau, it has a sharper head than the rounder headed gaspereau, but both are rough on the belly. Both are in roe when they come in to spawn up the Gaspereau or Horton river and Kennetcook river in Sheil's lake. They are used for food, fresh and smoked. They feed same as a shad and fatten up after two weeks and improve as the season goes on. Line fish are wholly gone before we begin our fishing.

William Withrow, Newport Landing, said he had five or six years' experience at fishing. He was a farmer and worked about the bay with scows, &c. He agreed

with the last witness (Mr. Card). Sawdust is filling the rivers and killing the shad. Almost 30 miles are covered with sawdust from the mills to the eastern bar. The mills on the Kennetcook are : (1) Clarksville, two mills, Bentley's and Campbell's; (2) Mary Ann Brook, mill; (3) Dodridge's two mills, Dodd & Allen and D. Allen; (4) Zwicker's one mill, above Kennetcook. I have seen shad with gills full of sawdust. Lacy Brook used to be a grand trout stream, but sawdust has destroyed it. I don't think it kills salmon, but it has driven them out of Kennetcook river; Simpson's Hole, where they spawned is now all sawdust. We have got salmon up to 17 pounds. I say stop the killing of spawn shad. The Shubenacadie men ship them to Truro, &c. I have seen a 10 pound spawn shad caught in Kennetcook river at Stanley below Clarksville. A five pound salmon will tear our shad net. Nets are torn to pieces by salmon. The weekly close time, Friday night to Monday morning, is generally observed. I may say that I have known big catches of shad, as 1,100 to a boat, in one night at Walton.

John Spencer, Windsor, fisherman, said he used drift nets only and his catches were shad, salmon, cod, and a few bass. He used 4-inch mesh to 5-inch. At first when 17 or 18 years of age he got lots of fish with short nets. Only 50 to 70 fathoms used 40 years ago. Ten years later longer nets, 200 fathoms (1,200 yards, 300 on the rope) used, but some still use the shorter nets. A boat and its net is $150 to $175 in value. A fine net lasts a year. We use boiled oil on our nets. I never got a spawn shad. We fish from 18th or 20th June on. Because of floating sawdust and sawdust on the feeding grounds on August 15, one season we got no fishing, so went to Kingsport and got good shad fishing. The causes of injury are, in my opinion:—the killing of immature fish, including hundreds of small salmon. Everything is stopped by the seines. They cover very long pieces of the flats. About the middle of July small salmon were seen in the mill creek brush weir below Lepreau, between Kingsport and Blomidon. They were 4 or 5 inches long. Also a number of very small silvery fish 2 to 5 inches long, probably the fry of hake. The weir had no opening or gate. Sawdust is most serious. Drift nets have decreased as the fish declined and now there are only seven or eight boats here, but formerly twenty boats. I never fished for gaspereau, but the early fishing would take spawn shad if they were here. I had never seen any spawn shad in my fishing.

Robert Redden, Windsor. As a fisherman he had had 34 years experience in Minas basin, Cobequid and St. Mary's bays, and had taken shad, salmon, gaspereau, cod, haddock, hake and occasional halibut. He fished gill net and hand lines. In 1897 as the shad had dropped out, I and Layton with two boats from Windsor went to St. Mary's bay. We got 670 shad on a 100 fathom net (100 fathoms on the rope) and had only got three shad here the day I left. 1898 was a fairly good year, but the season was short and the total catch in the river was 120 to 130, but round the Minas bay, Hog Back, bay, 170 fish were got. The fish stayed in St. Mary's bay only three or four days and boats up the head of the bay got none, only three or four to a drift. We used 220 fathoms of net. In Cobequid bay they use 100 fathoms, *i.e.*, 100 fathoms of twine. We never use more than 200 fathoms because a longer net than that would cross the tide, but up the bay they fish 30 bunches 600 fathoms. In April spawn shad come up. We had weirs near Falmouth but we never got a shad in spring. At Avonport they got a few, two or three in spring. Last April we saw some shad full of spawn from the Shubenacadie and Henry McDougal said that one man in 40 fathoms of net got 160 of these spawn fish. Shad have not been kept out by increased traffic or noises, as the Hudson river proves. In St. Mary's bay you can see the shad moving in clear water in schools. In latter part of May small shad 4 or 5 inches long are got in the seines in which a mesh of 2 or 3 inches is used inside the seine. I saw two shad the other day on a drift, one being large and fat but the other poor, thin and bony with a big head and no body; its stomach was swelled with a teaspoonfull of sawdust. I

favour four things: 1. Restrict the sawmills and make them burn their sawdust. 2. Protect spawn shad. 3. Limit the mesh and insist upon a big mesh. Shad can't get into a gaspereau net. 4. Make them lift their nets as drift nets are lifted each week, Friday to Monday.

RALPH REDDEN said he agreed with the evidence given by his father.

FRANK BURGESS, WINDSOR, said he was a Dominion government officer and head of the Windsor hatchery. Spawn shad ascend the Avon, but owing to sawdust they are few. Formerly it was a good shad river. A few are dipped out on St. Croix river at Smiley's farm below Spencer's bridge. In Annapolis river 200 or 300 spawn shad are got by spring nets (set nets), which have been stopped by Mr. Dodge, game warden. Farmers catch the spawn shad and ship them to Halifax—30 tons perhaps in the season. From Paradise up spawn shad are destroyed in great quantities. These parent fish are 5 or 6 pounds weight. The Annapolis was white with small fry between June 1 and 10, 1905; they were fry ¼-inch long. Of 100 shad in one case taken when descending, 99 were males. There are two runs up the Nictaux river, namely, spring and summer runs, both going into fresh water. The Middleton Board of Trade got a prohibition of shad netting in Annapolis river. Small salmon are taken by shad nets; two shad may be taken to three to six salmon. I know of one 15 or 16 pound salmon taken entangled in a net, hence the large fish do occur. At Maitland they use a bigger meshed net and take 15 and 25 pound fish. The salmon taken by our men are only half grown. At Hall's harbour salmon 25 to 40 pounds weight are caught—over 600 tons last year, and I am informed 300 tons this year.

Seventh Sitting.

TENECAPE, N.S., August 7, 1908.

The evidence was opened at the Tenecape sitting by:

DAVID LINGARD, who stated that he was 24, when he began and had fished from that place all his life excepting one summer when he was sick. He had been 18 years engaged in shad fishing. He used a skiff boat and drift net 300 fathoms (20) bunches the mesh being 4½ inches, but now the mesh is larger, viz., 5 inches. We use more net when the weather is calm. The shad one summer long ago came on June 10, but have been getting later and now it is June 25 to July 1 before we see them. As to size they run 135 or 140 to the barrel (200 pounds) salted. The small pass through the mesh; but in the weir we get them down to 2 inches with the others. Off Economy shore, Colchester county, cart loads of small taken at high tides in the weirs, all dead. There was no time to use them in any way, but just sweep them out with a two-inch meshed net on a stick. I never saw any used as compost but heard of them. Here we had seven weeks steady fishing as they occurred all through summer about two months leaving about the middle of August. Shad came in to feed on shrimp, brown in colour. We got them on the nets and pulled lots into the boat. We rarely saw any spawn shad—an odd one in spring in May in the weirs. I once got a spawn shad with roe as big as my wrist; and I could count his ribs. He was very red inside. Those with milt (males) were not so poor. The spawn fish should be allowed to go right up the bay into the rivers into the Kennetcook and the Avon at Windsor where I know they spawn. One spawning place is at Kennetcook corner seven or eight miles below the station. Four years ago I got shad which I knew were spawn fish in my net,

ten or thirteen of them. Summer shad never go into rivers. Mr. Nelson and George Smith told us that three or four men went trouting up the river Kennetcook ten or twelve years ago and they came back with a wagon load of shad. They said that local residents had got them early and sold them. The weirs built for herring and cod all along the shore took shad. The Burn Coat bay weir and the weir got all sizes of shad. Weirs take large shad and odd salmon. Shad especially large may drop out of the gill net when they die if there is any sea on. We only got thirty or forty shad this season—eight on a tide. Shad are afraid of a brush weir and when inside won't go against it but keep away, but bass and salmon will go through. Shad nets, when new take salmon, but when old they get through, but may roll up in it. Salmon run from ten to twenty or forty-five and forty-six pounds. A shad net of Vinton Faulkners Londonderry got $60 worth of salmon in one week (the last week of fishing). We can drift up the bay for shad in the day time when the water is roily, but lower down it is clear and they see the twine. Our practice is to usually go up the bay above here and drift down to Walton or a little below. Twenty-five years ago shad fishing was good, some years they were scarce. Nine years since this summer we had good fishing and I got 4,700 in my boat, and one of my boys got 3,000 or 4,000. Another boat here got the same. Walton used to have many shad boats but there are none now. Here four boats fish, and out of Walton three, and between here and Walton seven or eight boats. One boat only is fishing this season along this shore here. Weirs may have helped to destroy the fishery, but the main cause is killing spawn shad up the rivers, as well as sawdust. Sawdust is bad, for when Geo. Smith put up a mill here and put out a pile of sawdust on the flat the shad all left. Mr. Curling now in Parrsboro', told me forty years ago that he got sawdust inside of shad. Captain Hill who cleaned for Mr. McDougall (Henry) said, 'I opened two and the stomach was full of sawdust.' They looked in poor condition and he wanted to find the reason. We see no young shad and can't have shad if no young, but we once got them tangled in the nets they were 4 inches or 5 inches long. We used to barrel and ship shad to the United States, and the merchant paid $7 or $8 a barrel, once I got $11. Nine years ago I got $5.50 to $6 per half barrel. I sold 75 barrels to A. Fulton and Amos Hill, Great Village, and I sold a lot fresh at $4 per hundred because I did not want to salt them. One man got 5,000 in one week at that time. In 1883 or 1884, I got 951 inside Walton bar. You should make June 25 to August 25 an open season, as spawn shad run up early that would stop their destruction, also they are down before that. Also keep the weirs out in the bay and they won't take spawners. Our method of curing is to split them in the belly and take out the backbone and sliver the tail off. We keep the scales on to keep in the fat. Soak them three hours and salt using a lot of salt the first time or they will spoil. Cover them with salt or where they touch will turn black and they will stick together.

John A. Lingard, Tenecape, said he began fishing at 14 years of age. Shad fry are killed up the rivers just as the trout in the east branch of the river here were driven out and killed. Spawn shad must be preserved. I think it would be worth while to take out all the weirs. They don't pay at all and we can catch cod with lines. There was hardly a weir 7 or 8 years ago, but now a few during the last 2 years have been put in especially on the Colchester side. We have a weir here. We have quite a few eels here but they get out of the weir as we don't utilize them. They devour lots of little fish, indeed I've seen the eels sucking up the tom-cod, &c. We see a few alewives, but don't fish for them as there are not enough to barrel. Shad will mesh in a 5½-inch salmon net, but the small go through and will grow up by and by. A 7-inch mesh will take big salmon but we don't get any here, we hardly ever see a big salmon jump.

Captain F. McCullough said that the decay of the shad fishery is a great loss to the people as well as to the fishermen. All would agree to steps for their restoration.

It would be a blessing. Shad helped to keep the people in the country ten years ago there were forty or fifty boats even sixty in the bay, but now not more than fifteen can be seen. Walton Beach was laid up with boats from the opposite shore. Everybody had salt shad for winter. One summer Mike McCullough, my son, fished and got a lot of shad, as well as King Clark, and they made $7 or $8 per day peddling them through the country.

Eighth Sitting.

THE SCHOOL HOUSE,
EAST NOEL, August 8, 1908.

The Commissioners (Professor Prince and Mr. S. F. Morrison) opened the sitting in the usual formal manner and evidence was taken as follows:—

J. GILMOUR MACLELLAN, Noel, said he had known the shad fishery for over sixty years and long ago they were plentiful. But his grandmother before him spoke of their abundance when she first came to Noel. She told of a weir set from one bank of the marsh to the other and it was filled to the top level of the brush wall. They were large shad, eighty would fill a barrel, that was 125 years ago. The weir was brush woven over stakes opposite a mud flat in shoal water and left dry as the tide went out. There was a little net fishing, about 24 bunches to a boat, especially at Bass river on the opposite shore, but only 20 bunches to the boat on this shore. The mesh was 5 inches and no small were taken but some very large. The weirs took small fish and many 2 to 6 inches long were used for manure, but these would have passed through the nets. Shad went up the creeks in June or July. The summer shad came to feed. I suppose a shad such as I have seen taken in May in a weir would be a spawner. The price was 4 cents each, or $4 to $5 per hundred. Then there is a great loss of revenue to the people and inconvenience due to a lack of an esteemed food supply. Of course there were years of plenty, and other years few shad, but never real scarcity, always really plenty.

JACOB MILLER, SHAD CREEK, said that as a boy he saw big catches. Once in 1871 or 1872 he saw 25,000 in a weir at Scott's Bay, Kings county, and another year later he saw 32,000. Every year the ice carried the weir away in spring (April or May). For eight years it was not in because it caught so few fish and did not pay for five or six years before that. The weir took shad, gaspereau, herring, cod, a few bass and rarely a salmon. I've known one or two early shad taken in it. They were very large ones. I think that the decline is due to sawdust, as I lived when a boy on the Kennetcook river, and many trout were in the small brooks, but in the river itself polluted with sawdust there was no trout, the taking of spawn shad up the river where they spawn is a cause of decline. Shad feed on sage chewed up. Sage brings them up and at South Maitland we'd get the shad with forks as they came out of the creeks where they went to feed in the latter part of June. I favour two remedies, (1) keep the water clear of sawdust; (2) stop the killing of spawning fish in the rivers where they go to breed.

SILVIUS MOSHER, EAST NOEL, said he had experience of weirs and gill nets. He had a share in the Old Point weir which stopped fishing 9 or 10 years ago. It took shad in April and May. Cod, gaspereau and herring were got early. Bass 10 to 15 or 20 pounds weight (10 pounds average) were got in the fall, a good many of them.

The weir was one mile long, 10 feet high in the highest place and had 1,000 to 1,600 stakes. It took two weeks to build but it was a slack time then. Sixteen men had shares, two men to a share, *i.e.*, eight shares. We only worked in short spells at the building. The weir took any amount of small fish, smelt and gaspereau and eels. Also small shad 1 inch to 4 or 6 inches long in July, but none before June 20; they were bright silvery fish, either shad or gaspereau. Alewives also occurred with them. We don't get these small fish in the nets. Any time spawn shad are got, they are in poor condition at last of June or in July, and are a long lanky fish not filled up. The spawn is two large rows but hard. I don't know that I ever got a spawn shad in the net. The net was 350 fathoms (or 25 bunches) and 4 or 5-inch mesh. I remember 25 years ago getting 4,000 shad in the weir at one tide. Sawdust and killing spawn shad are the causes of scarcity. I have seen 2 feet of sawdust in the weir, and the water was thick when the mill was running. Shad feed in slack water in 4 or 5 feet. We get them on the ebb tide.

Adam O'Brien, Noel. About 30 years ago I had my first experience with shad nets. It was at Bass river more than this side of the bay. We got 300 to 600 or 700 on a tide, but on Monday fishing two tides (all day) we would get 1,000; this would happen for two or three weeks in the best of the season. The length was 25 to 30 bunches, or ¾ to one mile, and the depth or breadth 13 or 14 feet (50 meshes). Shad had been more abundant before but the men used shorter lengths of net. They used to think there were too many 'rover' shad taken in the spring, and that sawdust bothered them getting in their gills, but that might be worse on small fish. Occasionally a small shad was entangled in the net but the water was too roily to see small fish if schools occurred. I have seen them in the weirs, but many would work out. I agree with preceding witnesses as to the remedies. A total stoppage would be a benefit to some, it would save them the expense of useless fitting up.

Michael Densmore, East Noel. He has known the shad fishery 40 years, especially the Noel Point weir. It took great catches. Some were salted and others sold fresh to the people of the back country. No. 1's sold for 5 cents each and two-thirds of the catch was No. 1's. We got larger fish than in the nets unless they were over 5-inch mesh. Twenty-six years ago was the last great catch when 1,200 to 1,500 were got at a tide for two months. Occasionally I have known 2,500 at a tide; 800 to 1,000 would be small; 15 years ago they fell to 30 or 40 at a tide, and some tides nothing at all. The decrease has been general. We noticed small fish in the latter part of August in great quantities, but we had a gate to let them out. Small shad are very blue on the back. There are two kinds of gaspereau, the 'shiners' or alewives, the name for the small fish 6 or 8 inches long and the gaspereau 12 inches long, but thinner and poor eating. Sawdust is hurtful and stops them from coming. Some people think they have gone to other climes but we cannot hear of them. Some think dog-fish are the cause; I saw 12 years ago 76 dogfish in a weir and the remains of two shad. Sawdust would cause strangulation but we did not see dead shad. Many say the river shad is a different species, but perhaps fresh water makes them different. They are not so broad in the middle and not so thick in the back.

Morris Densmore, East Noel, weir fisherman, had fished both nets and weirs. When there were no mills there were plenty of shad. Sawdust lodges on the feeding grounds where the fish feed on something on the mud. Fishery officers should do their duty and stop the pollution. Weirs take big shad four or five pounds weight.

Seymour Main, East Noel, had worked on the weir at Noel Point. Some young fish caught and undoubtedly die. Sawdust and killing of spawn fish have done the harm.

Mackenzie Ettinger, East Noel, said that for five years he was at Shubenacadie and Grand Lake (Elmsdale) ten or fifteen years ago. They make catches when the spawn fish go up about May 1, and get them again, but fewer as they return from June 1 to 15. They use a gill net with a stake on each side of the river set right across the river when no one is around at night. A wing of brush as far as allowed leads the fish to the net which is staked down river. Fifty or 100 fish, all full of spawn, are taken in a night. They are large fish with two roes but not so good in flavour as bay shad. Some are sold around locally, some are salted and sold in Halifax and other places. I helped to clean them. The men know they are not doing right. They are farmers mostly living below Elmsdale that I saw; but it is the same all the way up to Grand Lake. They get the shad all the way.

E. A. O'Brien, Noel, said that the decline of the shad is a great loss to the country. One or two boats taking 200 or 300 shad at a tide was important. Fourteen hundred have been taken at one tide and that meant quite a little cash value indeed, $50 to $100 per day to the community. This commission appointed by the government is a good way of getting all information. We can't get a shad now for less than 25 cents and thus the cost of living is increased.

George Davidson, Noel, said: The last summer I fished shad was 35 years ago (1883) and I remember I got 200 shad in one night. My total catch in my boat was 23,000 that season. My father always fished from the time I was a boy. We fished more net than the men above, and they did not get so many fish as we did. We fished 30 to 35 bunches of net 45 meshes deep and the mesh was 4¾ or 5 inches. I fished out of Little Bass river in 1883. There and in the next river were 9 or 10 boats. I remember Indians fishing there. Once I got in one hour's fishing in the 'nest' 1,250 shad, indeed we never fished long in that place we got such catches. I once got 1,660 shad with my own net and my partner's and we filled our boat to the gunwale. When the school struck the net my partner thought it was a school of dogfish. I never fished a weir. We never got many small fish, once in a while we'd get one in the net, but I've heard my father speak of small ones left in the weir. My opinion is that they are killing the spawning fish up above. One fish in the Shubenacadie and Stewiacke is more than a whole boat's catch if its young were hatched in the river. The Windsor hatchery is not thought to be a success, but hatching salmon succeeds. I have an idea that shad spawn and hatch twice a year as we sometimes got spawn shad in the fall but we rarely got one in the summer, just a chance one. Shad return to the same place where they were hatched. The shad we get don't differ, some think, from the shad above. We got very few of the Shubenacadie 'racers,' a few only at the first of the fishing. They were poor, thin and blue, but our shad were fat. Sawdust is quite a hurt to shad, it spoils the feeding grounds. Salmon are not affected. Economy river had the best feeding grounds but no fishing was to be had after the mill begun and the sawdust pored out. Officers don't do their duty *re* sawdust. I never heard formerly that the Shubenacadie and Stewiacke shad were caught to the extent they are now, but we all know that 'a shad is a shad now.' My fishing was mainly done on the far side (Colchester) side of the bay. The Noel fish weir has not been fished for a good many years, but it used to catch principally shad. Round here (Noel) it is all mud and poor feeding ground as I think rocky ground is best for feed. The shad feed on something in the water, bugs or shad fleas, as the more of them there was the more shad there were. There are no salmon in Noel lake, it is one mile long but they say something in the water is not good for salmon. There are four dams above Ben't in the stream from it and these would keep fish out. Mosher's mill at Minasville burns the sawdust. There is lots of plaster about, and that may not be good for fish, though one fish was got a year after some fry were planted by the government. It was said to be a trout. There are perch and suckers but no trout in the lake.

Oswald O'Brien, Noel, said: I remember plenty of shad taken in the Noel weir, indeed ox-teams took loads away in 1879. In the summer of 1880 the East Noel weir was stopped because the parties crossed the farm lands to get to it, and they fastened their gates. There was a squabble about the matter and the fish in consequence it is said left. Bass were best in spring and fall. Sawdust and the killing of the spawn shad had a bad effect, but some other reason must also exist. Sawdust hurt the feeding grounds. Gaspereau ascended Petite and Tene Cape brooks, and a curious thing occurred. The fish got up the right side and then wheeled about went up the west brook. East brook goes up into the plaster rock area, and the fish find they are in the wrong brook. People put a board across and kept the water back but as soon as they lifted the board the rush of water made the gaspereau run straight up. They spawn on the bars, about 8 or 10 miles from the shore, and people go there and net them on the beds. Holes in the Walton Aboiteau permit the fish to go up. Gaspereau are worth protecting as they are a very good fish on the table.

Ninth Sitting.

Public Hall, Maitland, N.S., August 10, 1908.

There was a large attendance when Professor Prince opened the session of the commission. Mr. S. F. Morrison followed with some appropriate remarks and evidence was then taken.

Mr. Isaac Douglas, Maitland, was the first witness. He stated that he was probably the oldest person present in the hall, being in his 86th year. He continued, 'I was eleven or twelve years of age before I saw a shad. Shad were scarce; but in 1835 I think or 1836, the shad came back. They were got on the flats in holes or pools left by the tide. We speared them for two or three years, and got as many as we could carry on our backs. The flats were alive with shad. Then small nets were used, 35 fathoms (one bunch). That was in 1837, and the men easily filled their small boats getting 300 or 400 shad on a tide. William Lawrence, as a young man, built a boat and secured 38 barrels his first season. Every one who had a boat then fished and got all they could handle. There was no trouble to get fish. Then they began to decrease. Why? Because the shad were killed on their way to the spawning grounds. I have gone from Shubenacadie to Milford and Elmsdale, and found every mile or two, a net strung across the river, completely stopping the shad. Three years ago a firm in Truro was called upon at breakfast time by a man who had 143 shad in a wagon, but he would not tell where he got them. Every fish was full of spawn. He was only one, and there were lots of others at the same work. Regarding sawdust I never have seen a man yet that ever got sawdust inside a shad. Some men use small lengths of net others have weirs half a mile long. The poor man is at a disadvantage. There is no fair play because the rich man has the gear, he can buy plenty of gear. The poor man cannot afford it, and gets short nets only. My grandfather told me of the shad fishery before my time and my knowledge of it goes a long way back though I never fished a day in my life. My grandfather said that the bay was alive with fish, it was swarming with shad. But they left because, some say, the people became quarrelsome.

Mr. John Dearman had fished shad 35 years. Had fished at Walton. Before his time shad had been scarce, but were plentiful when he began, but for two or three years shad fishing had not paid. He had caught from 100 to 1,000 in one drift in one night. He thought that sawdust had injured shad. He had split the shad's maw when gutting them, and it is like the maw of a bird. They feed on suction.

Shad first come about the last of April or May 1, they are the old spawners. These are destroyed up the Shubenacadie and other rivers by nets stretched across and by spearing in small brooks as they ascend to Grand Lake. Not six out of a hundred reach Grand Lake. Even these six or eight have enemies in fresh water. Trout will catch a shad 2 or 3 inches long. He had seen trout swallow other fish, trout or gaspereau, and eels are very destructive. Schools of young shad come down in the fall and move down to Florida, but these don't come back here to spawn. They come back fat and grown and we catch them. They come in thick at Walton about June 20, and we may get 500 in a night, they are that thick. I have fished from Burnt Coat to Blomidon, and for a few years at Maitland. As the waters are narrow here the fish are more crowded, thicker than at Walton. They are here earlier than at Shubenacadie. There is no spawn in them as they come up to feed. It would increase the number of shad if for six or eight years no fishing were allowed from Black Rock to Maitland above that, and a heavy penalty provided for violation. I say a fine of $900 to $1,000, or three years' imprisonment. The officers have neighbours and friends and don't want to offend, so don't do anything to stop violations. I never fished less net than 300 and as much as 600 fathoms (30-40 bunches). It is hard to carry out restrictions of length of net, and many poor men might wish to use a longer net. The mesh is 4⅝ inches to 5¼ inches, and larger mesh takes larger fish, but choke in a smaller mesh and fall out, but smaller ones remain meshed. Up the bay the shad are caught, first striking in at the head of the bay, but are fished the rest of the season at Walton. The fishing lasted eight weeks, June 20 to August 20, and we got 100 to 200 or 300 barrels, and shipped mainly to the United States, getting $12 to $20 a barrel; once we got $22, but there was $2 duty. The best catches were made in 1872 or 1873, and were good for seven years. They fell off, some men thought, because too many nets were used. St. John men came over with their big nets, and shad became scarce, only 500 to 900 being a season's catch. But the St. John men fished off shore of us, and when we stopped they got all the fish. When we got less than 100 to a drift we considered that it did not pay us; but that is a good catch now. I knocked off because I only got 100 shad on a drift. The fishery was a means of circulating an immense lot of money, because country people came in and bought hundreds of shad before breakfast. They took one or two barrels each and bought for their neighbours, so there was a great sale. I often had my pockets then full of 10c. pieces. I built boats and greatly feel the loss; the decline is a calamity. The salmon has improved and is not like it was in my day, when we got 3 pound small white bellied salmon, five or six at a drift, in July. The hatchery has done good and improved the size of fish. Fifteen-pound salmon are got, whereas 3-pound fish were thought good fish. Gaspereau are plentiful, and nets for them will mesh and drown a shad, and he'll fall out. I have seen a weir outside the Tail destroy small fish, the flats being covered for one-quarter mile around with dead gaspereau and shad. They drown in the weirs and go through the brush. Weirs are very injurious, few fish that come down escape capture in weirs, and I have picked up lots dead. Shad are caught in rivers in Maine, though immense cuts of lumber are made on them, hence weirs are worse than lumbering. As to the shad's food, it is not shrimps, as the maw is too small, and I never found shrimp in them. Shad never take bait.

Andrew Anthony said 15 years ago I ceased to fish shad. He thought the alleged injury of sawdust might be questioned. If shad were a ground fish it might be harmful. The food and the spawn fish were the two great matters. The food had disappeared; it was a little black worm. I found them in the boat. The killing of spawn shad was a chief cause of the destruction. These two causes accounted for the decline. I have seen shad stopped owing to a jam of logs as when Mr. Dickey was lumbering on the lower Stewiacke. I began fishing 50 or 60 years ago and shad were pretty thick then. They ran thickest about 1860 to 1865 but were not so big as

now, 125 or 135 to a barrel. Shad Creek weir took very fat shad at the latter end of September. They were late shad and ran about 90 to a barrel. They only lasted a day or two. No one drifted at that time; in St. John shad are caught early but were never so thick as with us. In the United States shad were caught in April. I fished from Salter's Head to Tenecape or even Walton. As a remedy I suggest that setting nets in Shubenacadie river be stopped. Sawdust is not serious and some will go in whatever you do, nor will short nets do as we must have long nets to make it pay. Across the bay from here they used the longest nets, 25 bunches (480 fms.) being used by them but we used 16 to 20 bundles. I don't see how the length should be limited though I think it would be a good thing to limit one boat to each fisherman and allow only one net to each boat. I never got 400 shad in one night at Tenecape and we fished a day here and a night here.

Captain John Graham said I have fished at Five-mile river, S. Maitland. I fish for salmon and gaspereau and commence about May 1. I use a mesh of 2½ inches in 30 fathoms. The gaspereau last till June, and they are full of spawn and are on their way up to the lakes. The first run has more males and the fish are largest and fattest. The last schools are pretty thin and called 'mallheyers' or black bellies. They are black inside and are larger and run by themselves, their colour being different and darker scaled on the back. We call all gaspereau. We get an odd shad, fat and full of spawn but they won't easily mesh. We fish in muddy water. The gaspereau are without doubt getting run out. Enemies have thinned them, among them being the large striped bass 30 or 40 pounds weight. I have opened them and found six or seven gaspereau in them. They are got in October. More valuable than bass are the gaspereau and salmon. The chief harm done is up the Stewiack river by dams stopping the ascent of salmon and shad. Sawdust is most injurious and when water-soaked sinks, covers up and destroys the feeding grounds. It is not in their gills as some people think. Salmon are 10 or 12 pounds on average, but I have caught 20 pound salmon. Four to 15 pounds is the usual size taken. We formerly made better catches as more salmon got up the rivers than now, indeed I got 10 or 12 in an eddy but only got an odd one at Plaster or Big Rock. Formerly 14 or 15 boats all catching salmon, but they don't go there now. Nets are often set right across the river, but no great amount caught, every one is a spawner and should not be caught, being of great value to the fish supply. Dr. Black's hatchery cannot be of full benefit because fish are so obstructed, there should be a clear course for them. Not a dozen nets now between here and Shubenacadie where formerly everybody had a net, it is a big loss to the people, but a hatchery should do good if given a chance.

Isaac Faulkner, Princeport, had 47 years' experience, beginning when 10 years of age. He spent some years on the Pacific coast. I fished from Tenecape. Holliday, of Halifax, caught the first shad in the bay at Holliday's beach, Economy. Shad were plentiful then. James and William Hill fitted up a boat and net 45 or 48 years ago, but shad were scarce and three barrels only was their catch for the season. Shad returned after that and for years fishing was good, 5,000 to 7,000 to a boat. In 1879 they were more plentiful than I remember. I fished for Lindsay Moore and got 14,000 in five or six weeks, Joe Taylor got 21,000 off Economy in that time. I fished 25 bunches, 4½-inch mesh and later 5-inch. Masstown fellows got two weeks' fishing before us. Fishing was from Masstown to Parrsboro on our side, and Maitland to Windsor on the opposite shore. In 1879 I got 1,200 shad in one night's fishing. In 1880 I got a total of 6,000, but in 1881 not half so many. Fishing has never been good since, though 10 or 12 years ago 3,000 and it has dwindled till it is small fishing. Ours are not spawn fish, rarely I got one, just now and then. I sold to Johnny Fraser of Folly, but for eight or nine years fishing has been poor. Salmon have been plentiful but 12 or 14 years ago more than now, one day 14 years ago I got 57 salmon. They ranged from 3 to 15 pounds, the largest was 22 pounds. Here a 7-inch mesh would

not pay, a big fish might be caught, but the Pisarinco (Lornesville) men get a different fish from ours and can use a bigger mesh. I notice spawn in our salmon but it is small. Six or seven years Hants and Colchester (Portaupique) men petitioned for the close season from June 15 to August 15, but it shut us out too early some said. Three things have depleted fish, viz.: weirs, dams and sawdust, but the last is worst as it stays on the sandbars on which the shad feed. The best remedy to restore the fish is protect the spawning fish.

Dr. CREELMAN, MAITLAND, said that a hatchery ought to be established and he heartily endorsed all that had been said. He thought that the commission should be satisfied with the morning's work as the evidence afforded a clear and comprehensive view of the shad question. He knew that the shad did not go further than the mouth of the river, *i.e.*, the middle Stewiacke, except very occasionally.

THOMAS CREELMAN, PRINCEPORT, said he had 10 years experience river fishing. He used the drift net. The net is 35 fathoms long and 3 or 4 feet deep. We get only three or four shad to a boat in a night, but up river 100 to 250 is a common catch. Once or twice in the season we find gaspereau strike our nets, and we can tell it at once, but they do not mesh. I consider the striped bass the worst fish of all, it is destructive. A boy caught an eel once and a bass jumped and grabbed it and was pulled into the boat. Gaspereau nets do no harm to shad. We fish in muddy water. We get only 70 or 80 spawn shad, but one Truro man takes 300 spawn shad up the river. Green's creek has two dams but no fishway. I have seen shad five miles up the river when the dam was broken and injured, but none since the dam was repaired. Sawdust is injurious as it smells bad. The government once paid $300 towards a fishway on Fivemile river. Thousands of salmon are killed by log booms coming down. Dickey's mill should be looked after. Don't think of one class of men when dealing with shad and salmon matters. The officer (Macdonald) does not do his duty regarding sawdust and other injuries. Of course Stewiacke men will object to restricting fishing in fresh water, but one Truro man made $500 in a season. Eels should be caught out if it could be done as barrels could be taken. There is no sale for them, freight also is too costly. They eat the spawn of other fish. They can be caught in the winter. One serious matter is the sunk wire-net weirs set from the Forks up; they scoop out the fish.

Tenth Sitting.

SHUBENACADIE, N.S., August 11, 1908.

Professor Prince having opened the sitting, and Mr. Morrison having added some introductory remarks, evidence was taken.

WILLIAM M. NELSON, SHUBENACADIE, said that he was a shoemaker but had fished for some years shad, gaspereau and salmon. He fished just at one place near the town. The gaspereau appeared about the middle of April; the 13th is the earliest and they last to the end of June. They ascend by spurts, some day a lot, and then none, the later runs are not so good. There are two kinds, mulheaden or blackbellies and alewives or gaspereau, the former being dark inside and Maitland people think they are a cross between herring and gaspereau, they run last. Two weeks after the gaspereau come the shad. Occasionally the gaspereau nets take a shad, but the mesh is too small to take many. A stray Bay shad, a shorter, fatter fish, is taken especially if a

salmon net is set. Our large shad run 9 pounds weight; all are spawn shad and occasionally all run large. I have caught them coming back, a few 'spent' ones, but they are no good, they are poor and thin and so weak that eels chase and take them. Eels are extremely thick. You can't leave a salmon in your net or an eel will take it, commencing to eat it at the gills and devouring the guts. Often an eel drops out of a salmon when you take it out of the net, leaving only the backbone and tail. Some eels are as thick as your wrist. I have fished for nearly 40 years and gaspereau are larger now than formerly, and some use a 3-inch mesh, the best being 2¾, none less than 2½-inch mesh. Shad were more plentiful when I began, and fishermen came from other places and got work here and fished shad, some are farmers, and I heard of people coming and camping. Gaspereau come down poor, thin and scattered about July 1. The last of April the sea bass are fished first down at Maitland and they follow them up for a week as they go down at once after spawning. They are taken in a 6 or 6½-inch salmon twine, 30 fathoms and often set from bank to bank. Shad makes no fight, no fuss, but bass fight. Bass come when apple trees are in blossom. I have got some accidentally in my 5-inch salmon net. Shad won't go through a 6-inch mesh. At first only three to six boats fished, but now twenty-five to thirty. Only two or three boats fished at Shubenacadie, but they increased below greatly. As to catches of shad, I have got nine one evening when fishing for other fish as I never paid much attention to shad because they go past to clear water at Milford, the Woodworth boys got 100 in a night and Frame did the same at this side of Milford. The shad go up this river to spawn and for no other purpose, and I have always thought that the decrease down the bay below was due to the taking of these spawning shad. Sawdust does harm to shad and the river is more full of it than ever before. I'd like to see shad plenty again. Enforce a law stopping the killing or spawning shad. I often have heard people say that it should not be allowed and I think so myself. Salmon have changed in size, they are larger and look different. They are darker colour, stubbier and heavier built. I ought to use a larger mesh than usually used now as I have lost a great many because they were too large to mesh properly. The men set nets from bank to bank and from top to bottom all along the woods near the Dutch settlements, and some have sunk nets of wire and make big money. They don't depend upon it for a living. From the last of April to the last of May there are no shad and gaspereau nets being small mesh would not take early shad. Gaspereau are not as plenty as formerly but a great many were got last year below, eight miles down on the bars. They lay there at low tide and can't get up till next high tide. Our shad here were never important commercially but bay shad were shipped up here and were of value. Spawning striped bass roll and throw themselves out of the water, making the river all in a foam. We call it tumbling. The bass are all crowded together. Every year they come all at the same time. They 'tumble' in the daytime in muddy water where it is salt when the tide is in and fresh when the tide is out, then they go back straight to the sea and we see nothing more of them. Salmon fishing here is stopped by freshets and I think they then go up, but some think the fish then are sent down. We don't see the officer much. He is a farmer and often too sick to patrol. He must be about 65 years old and has asthma. On Saturday nights he is sometimes around, and has been officer for three or four years.

JOHN MCPHEE, SHUBENACADIE, stated that he had fished off and on for thirteen or fourteen years, but has lived here more years than that and remembers the fisheries forty years back. There was no trouble getting shad, trout, or salmon then. Gaspereau nets got sea trout one pound weight occasionally, but none taken for two years. He lived about Milford and fished every summer there, beginning with gaspereau in April, then salmon later say July 1, and often in June. In gaspereau nets shad are often caught by the gills. Shad are a week later than gaspereau, say the last of April, or if gaspereau are about the 10th to the 20th of April the shad are a week after that. The shad are big, 'whoppers,' all females, indeed I don't remember a male

at all. They are swollen with roe, two organs at the sides. I used to fish with a salmon net for shad 5½ inches shrunk to 5 inches. Our catches would be fifty in a night, often three to five only. The first run were the biggest and were going up to spawn but some had spawned or were without spawn. I never kept record of the season's catch. After the shad the salmon ascend. As to small shad I saw them three inches long go down in the fall, the big freshets at that time left them on the grass banks. I used them for bait, setting mink traps in October. There are too many people fishing especially up at Milford, and they are not particular about their nets. We have all short nets here, but they use nets, some of them 100 to 200 feet long, but 30 feet should be the maximum. So many are fishing that salmon can't get up, as one says, 'I've as good a right as him to set a net,' and many are not very particular as to long nets. The officer used to patrol, but we deceived him by setting a stake in the river at the right place. You may restore the fish and get them back, but you won't keep them long, that's the trouble with our fishing, viz.: too long nets, and fishing all the time. None of the men ever depended on fishing, they all had farms. Some might go around with a car-load of fish selling them in the morning after fishing, but we could never catch fish like that here. It is fresh water above and the fish would stay there in deep holes and they would be caught. Down the river nets are too long they spoil our fishing here. I never hear of catches worth anything and I'd hear if there were any. For two or three years we have never got a shad in our gaspereau nets, but formerly we did get a few. There are no dams between here and Grand Lake, but in the small streams both dams and sawdust, and shad are injured. The fish that go up the Stewiacke do not belong to this river. Up there I heard of dead shad being found among the logs. When the water is low the logs are on the bottom. Shad can't go through streams both dams and sawdust, and shad are injured. The fish that go up the Stewiacke, and the biggest catch of shad was below a jam, and the people pitchforked them out. At Milford, the bottom is sand and gravel, not much mud there. We sold the shad whole at 10 cents each first, we'd sell them for more up river. Last summer I caught nothing so I stopped. The bay shad are better than ours, being fatter but not so big. Striped bass are irregular, every five or six years they come but not every season. They are four or five pounds weight. In the close time plenty come, schools of 100 rolling and playing half a mile down the river very rarely above Benjamin's mill. They spawn all over the river and up St. Andrews river or Brook. Too many nets are used, any amount of them in the non-tidal portion up there above Milford. We set nets at dark and lift them in an hour or so or take them out at daylight. The Noel 'summer' shad rarely get into the river i.e., the 'Bay' shad. It is pretty bad we can't get a fish here because of the long nets below. We notice that the big salmon come up first and they run larger than they used to do. Three or four years ago one got 23 pounds weight. He did not mesh as he could not in the 5 inch mesh. For big fish six or seven inch mesh is right, and a good many get clear, they cannot mesh.

ROBERT GASS said that his experience exceeded 30 years. Good catches of shad are made here, drift nets being used. Shad run four or five pounds or even larger. One boat may take 300 shad in a night, but they have fallen off probably not a third of former takes now secured. Most of the catches are sold locally, farmers buying them for their own use. The former price was 8 cents or 10 cents and two big ones for 25 cents, but they are 25 cents each now. There is not the demand for roe shad that there is in the United States. We see both sexes of shad, but most of them are female. The shad's worst enemy is the fisherman. There may be a case or two of sawdust, but little trouble on that account exists now. The close season should be enforced to give the fish a chance. It would be no hardship, as it does not pay now and no man depends on fishing. Every farmer formerly had rigs, but only two now fitted out for fishing. There is no impediment to the ascent of shad from the mouth to Grand lake. Eels are plentiful, and they are speared in winter. Two or three years

ago several tons were shipped to Boston. There are nets above set across the river completely, and they touch the bottom. Up there is where the harm is done. It has always been considered that this is the natural spawning ground for shad for the bay. It has always been considered that all the fish that come up the river are fish from the Bay of Fundy; the opinion of old residents for 30, nay for 50 years, is to that effect.

BURCHELL FULMAR said he was born at Five Islands, and to a small extent helped in shad fishing, and had seen 2,000 taken at one time out of a weir. They were not the shad seen in the Shubenacadie, which are the mother shad, and are softer the longer they are in the river. In May and June here they are loaded with spawn and are no good for food. They have not the taste of the salt water shad, but are larger, being twice the size of the bay shad. In Minas basin and Cobequid bay a 7-pound shad is rare, though a 9-pound shad has been taken. I never saw a male shad in this river, and there are no small shad. The large shad keep out in deep water below. Spawn shad are large and soft; you can tell them as you take them out of the net. Bay shad are hard and firm. Thirty-six years ago excessive fishing was carried on, everybody having a net and boat. From Milford up there is ten times more fishing than below and more fish caught, nets being right across the river, which is narrow, and the nets are deep. At Highland village in 1872 there were six weirs, and 1,800 to 2,000 shad were taken at a tide, but in 1907 only three or four shad, and I bought them. At my home (Five Islands) they had seen no shad when I visited there except the three or four, I mentioned. They still put in gear in the hope of catching something. The Five Islands people made their living shipping shad and potatoes, and got winter supplies from their earnings, as very little lumbering was done then. All the way along the coast from Economy that was their mainstay for the greater part of the people, and some made a pile of money. As a remedy I suggest shad fry being put in the river. For this side of Cobequid bay it is the best spawning ground, as from Great Village to Parrsboro the rivers are short, rapid and unsuitable. In this river there is no dead water, but all running water, which is best for breeding shad. Small striped bass stay in the river, and immense quantities, car-loads, are taken late in November, when 3 inches of snow are on the ground. Plenty of them occur near the old look, as well as lanky 'slinks,' spawned fish which they put back, as they are not fit to eat. Grayling, like a long salmon, are plentiful in Grand lake, and are caught with line baited with pork. The salmon up to September are fine, none to equal to them, ranging from eight to fifteen pounds in weight.

JOHN ANDREWS said he had known the river all his life and though a farmer had fished gaspereau, shad, salmon and a few bass. All were scarce but shad were scarcest of all. This year salmon were scarce here but a good many were taken down below. High tides and freshets give the fish a chance to ascend. I have fished only here and I noticed the gradual decline. Formerly nearly every farmer had a boat, canoe or dug-out and used a short length of net. The gear cost $6 or $7, viz., boat $4 or $5, twine $1.50 and rope 50 to 75 cents. The net had a staff at each end but no float, and was 40 to 60 meshes deep. It had little loops and stones were attached as sinkers. I fished for salmon but got shad like others. All the old people are unanimous in saying that the shad went up this river to spawn on the gravelly bottom. As shad travel on the surface it would be wise to make the nets shoaler and allow a few shad to get up.

MARK ANTHONY said when sawmills started up on all the streams and sawdust went in the shad declined from that time. On the Kennetcook you see the shad on the top of the water and oftener we'd see the wake of them, and I made spears and speared them during the summer, the water is muddy. Shad were got this spring above Grand Lake and gaspereau got beyond Fletchers. A good shad pool was up Gays river at the last of tide, and in Nine-Mile river. Mr. Donald Sutherland and Mr. Peach were great salmon fishermen but failed to get our salmon to rise to the fly.

from here to Grand Lake trout rise but not salmon. Striped bass take the minnow and afford fine sport at the mouth of Gays river. I may say that I had a shad, with no spawn, cooked. It could not be a bay shad as none are brought here. I think it was a male.

R. Holesworth said they dip gaspereau up at the Lake, St. Andrew's, where there is an old lock—the old Fairbanks canal. The first run caught there are good but the spawning fish are caught and used as food but they are not good, being thin and worn out. You must prevent deep nets which stop every fish. A three years' close season would be good. They are very scarce yet, I have known 500 taken above here in a night. The Bedford fry brought from the hatchery seemed damaged on arriving and still had a journey of 30 miles to go. They were weak and were put in cool water to freshen them before being planted in the Musquodoboit where I saw them. Gays river is polluted with sawdust. Fry should be planted near spawning ground.

W. M. Nelson recalled, said that small fry are seen at the edge of the river bank but a freshet makes them invisible. The shad is the most stupid fish in the water and bunts against anything; the net used is 26 meshes, *i.e.*, 6 feet deep and weighted with stone sinkers.

Eleventh Sitting.

Elmsdale, N.S., August 12, 1908.

Thomas Logan, Elmsdale, said he had known the river for over 60 years and he fished shad and they were very plentiful then, 75 were got in one night with a net just below Elmsdale. That year shad were plentiful. During the last two or three years they have been scarce and this year scarcer than ever before. Many don't keep the law but set nets nearly across the river, some right across, but formerly this abuse did not exist. The mesh is $4\frac{3}{4}$ or 5 inches. Shad can be seen still and not moving in the daytime. I have caught them mostly head down stream as if they came up and played down. They were for my own use, but we sold a few and corned some. The females had spawn but a good many were males, and were smaller, fatter and better eating. Usually there were more females than males. At high tides they run up, males and females mixed. After a few days there would be none and later another run. Two or three runs occur. They began about May 1 and we got seven or eight in a morning. They stop them down below us and it is unfair to us above. I don't notice the spawning schools so much now because the fish are scarce. The water was alive with spawning fish when they used to be plentiful. They say the fish scour round in the water and play so that they can't be netted. They won't go into the net. Some think they spawn in the lake but none are got there, and they spawn in the river, especially a crooked place called the Oxbow or Carson's land, a muddy grassy place with gravelly spots. This river is undoubtedly their natural spawning ground. There are no dams now but locks, one being near Carson's. As for shad fry I'm not sharp at seeing them, but I think I've seen great quantities. Eels will eat them but won't touch a striped bass owing to the 'saw' on their back. A man took out half a ton of eels by spear in one day through the ice late in the fall. Joe Howe, the Indian, fishes eels here and ships to Boston. Few got this last winter owing to high water. No one fishes for a living, they'd not make salt. Our gear is worth only $3, net and rope all ready to set, the canoe is roughly made of boards. More shad are caught at Milford because they set handy to the logs; there is a boom going well to the bottom and

it stops them, but it is hard to prevent them getting through. Fewer men fished 60 years ago than 30 years ago and got more fish. Allow them to fish half the time and let no one have more than one net, some have more but they say that as many nets are put in the water as can be put in for some miles below here. Shad run from 2 pounds to 5 pounds before cleaning, but I have seen one 8 or 9 pounds, a chance one, a kind of king. Richard lives near the tannery and he and his boys fish mostly illegally and think they own the river. They lost a net this year, as it was seized by Officer King at the Horans. The officer is in Halifax county. Two or three years ago it was said that some shad were found killed, it was thought, by sawdust from Corrigan's brook, the sawdust had come down a mile at least. I have never seen a poor, thin shad here. We don't want them. We get a chance salmon now and then, but rarely. Gaspereau are easily got but not many fish them now. A net 3-inch mesh if attended to will take a lot. They run earlier than shad, and are a good fish when going up, fat and fine, to the lake, but they come down poor. Early in April a few come. It is difficult to distinguish the male from the female gaspereau.

THOMAS CARSON said he had a knowledge of the river over 40 years and had fished shad gill-nets 5 inches to 5½ inches. He bought the twine and got the nets made here 3½ herring twine, half a pound in a hunk. The depth of the net would be 8 to 11 feet and 50 to 60 feet long; some used shorter length. It had no floats, only rope and weighted with stones or iron. Generally a canoe was used, a dug-out or made of boards. The total cost of the gear would be $8 or 9, *i.e.*, net $5 and boat $3 or $4, but a good dug-out might be $10 or $12. We begin fishing May 1 to the 10th. They stay back if it is very cold. Ice goes out last of March as a rule. The shad stay in deep holes during the day and when evening comes they go up and play and splash in shoal places. I fished a little this spring and only got 30 or 40, the water being high. Many years ago we would get ten to one we get in a season now. Living beside the river I'd rather fish than do nothing, and I do as well at it as others. By the time the shad get up here they are thinned out, they take so many down the river. Ten men fish now to one formerly. The female shad are the biggest with spawn in them. I have seen one of 8¾ pounds, but the males are the best shad. I have caught them after spawning and they are no good, yet many will catch them and seem to like them. Both sexes are poor and thin. The fresh water and spawning make the fish inferior. I have seen them spawning once only when fishing above my place on sand and gravel. There was a cross log and I got two or three trout and I had a little fellow to lift the killock and he let it go too far. Two shad were there working in the sand in 3 feet of water. They certainly do spawn between here and Enfield, but they never go people say, into Grand Lake, and no one ever saw or got any spawning shad there. An odd shad has been taken there. They could go there if they desired. This river is the natural spawning place for shad people generally say. If nets were set lawfully some fish could get past. Most people don't know how shad are taken as we never get them heading up stream. They go up and down head first. They mesh descending and only in shallow water. I have seen them strike the net but never mesh going up. They arrive May 1 to May 10, and may spawn about June 1, and return back at once to the sea. Two-thirds of the river channel only should be occupied. I have never fished for salmon and very few are got. Eels are one of the great curses. When the shad are here the water is alive with eels and they get hold of the shad immediately he meshes and before you can get out to him. They are even worse on salmon. We fish eels in winter but they are fewer than when shad gaspereau and salmon are running. Eel pots were tried but were not a success because other fish were at hand to eat. A negro from Truro came and strung worms on a woolly cord and made a big ball and he easily got a couple of very big eels. The bay shad are best and are like our male shad. We salt our shad here. If a restriction were legalized some would observe it, but others would keep on, and it must be enforced on all. Shad go up Nine-mile river as far as the bridge, eight miles up and some sal-

mon go. It is all gravelly bottom. For half a mile up this river to Enfield lock it is sandy and spawning ground is anywhere.

JOHN RICHARDS, ELMSDALE, born at Truro, Hyde Bridge, said he was a mill saler, employed on the Intercolonial Railway. My father fished forty years ago when I was a child and I fish. Salmon are got here 15 to 20 pounds in weight. Five miles below here is a great place as they lie there the bottom being clean sand and gravel. The fish spawn there. Woodworth got a 20 pound salmon this season. Nine-mile river is one of the best in the country as it is clean. Forty salmon were seen in one hole lying there waiting for water which was low. Five inch mesh would entangle big fish but 6 inch is best; better than 8 or 9-inch. The finer the twine the better. The size of salmon on the average is not so big now though old ones exceed the size of salmon formerly. Owing to the freshet no fishing is going on. Millions of eels are seen waiting to devour the spawn. They devour the fish when meshed in the nets. The small fry—the poor little things they are snapped up—indeed a week ago the eel grass was alive with eels. I've never seen eels eating spawn but it is reasonable to think they do. Eels so plentiful that tons were sent a few years ago from Milford to Boston. Fifty tons were sent in one week, and they were so plentiful that every farmer took part in the fishery, the price being 3 cents per pound in the round and 5 cents split and skinned. They are salt water eels which come up and then travel back to the sea in the fall. The Indians set eel pots at the settlement to take eels coming down but no one does it now. Yet millions come up in June and about the 1st of July. They are fine to eat and worth more than other fish, but they are scattered and it is difficult to get past tides. One hundred to two hundred have been speared in a day in winter. They are got through the ice as they are in the mud then. The shad were very plentiful about 1893, and a net set would take 75, 100 or 120 in a night for a season or two, but they slacked off quickly because of sawdust pollution and eels. In the spring of 1905-6, one man here got thirty or forty they had decreased so much. Old people say that shad come back to the same spots. The spawning grounds are not below Sandy McDonald's, Barney's Brook, because tide comes up there and the bottom is mud—there above a good clean bottom. They spawn at Enfield and come down looking long and lanky. The Shubenacadie and Nine Mile river are their natural spawning rivers, and they should have been used better. The 5½ inch meshed gill net will take a 10 pound shad. I never weighed them, but I think I have got eight pound shad. The larger are females, the smaller are males and are the best fish and are sharper in the belly. The spawn shad is flappy and gutty, but as people like the big ones the female shad sell better. The males form half the schools and are better quality. In spawning both kinds of fish I think have to be present and the milt, which is white must go over the eggs. After spawning the females may remain about for a fortnight. Shad are scarce because you can set a net and not get 100 fish all the spring when a few years ago 700 or 800 would be taken. Fifteen years ago about five hundred fish to each farmer fishing shad at Milford, as it was a great fishing ground, the water being just right. There were more nets there than here. Probably twenty nets are set down at Milford and about seven here, and about thirty from Milford to Elmsdale. The average catch for each will be 500 shad, not more fishermen than was the average 15 years ago. Mr. Scott bought the fish; he kept store here. There are not more men fishing now than formerly, really fewer, indeed very few here last spring. Next spring may see a good run of shad. Shad are caught above the net; you can't catch them below the net. It is said that men set nets across the river from bank to bank. Shad can get past, as they will go round the stake in shallow water. My father got 60 shad in one 'looking' some years ago. Men who use shorter nets take more shad. They play up and down. Nets set across are no damage to shad, because they will keep below it. My catch this season was 150 shad and three salmon; my boy, Clarence Richard, fished. Shad only go to Horne's settlement, near the top mouth of the river. The best fishing is between Shuben-

acadie and Milford. There is no law against catching fish, but people are afraid to tell their catches. I think a close time should be started, it would help the shad. It would be all right. They fish only four nights per week now. After spawning the fish would come back. Gaspereau go into Grand lake and they keep up in quantity, but no quantity of them can be caught. The fish are in the river all right, and are caught at Horne's settlement and at Grand Lake. Porter's lake men will come over and seine them with seines half a mile long in Grand lake. Why are they allowed to do that and we residents restricted? Spent gaspereau are no good except for niggers in Bermuda. There is a little brook I have seen black with gaspereau. A mile above here is a fine shad spawning ground. Some think sawdust is bad for them, but I never saw it in their gills. Gay's river is said to be bad for sawdust; it was a good shad river, and they got up to the dam, but were killed out.

Twelfth Sitting.

HALIFAX HOTEL, HALIFAX, August 13, 1908.

The commissioners met a number of representative men of the city in the manager's room at the Halifax Hotel, and after the usual opening remarks by Prof. Prince and Mr. S. F. Morrison, evidence was taken.

Hon. B. F. PEARSON said that until he was fifteen years of age he lived in a district where the shad fishery was of very great importance, and most of the resident people took part in the taking of shad each summer. Roe shad appeared never to be taken, indeed he never knew a roe shad until he got it in New York served up at the hotels. Shad full of roe were really unknown to the bay fishermen along the Colchester county shore. The shad had declined to a serious degree. The restoration of the shad would be a public benefit of the greatest moment. The fishery gave employment to a great many resident people for a part of the year; it was a remunerative occupation, and it furnished a cheap and greatly esteemed food to the people. The Bay of Fundy shad were recognized as a superior fish. He agreed with those who urged the protection of the mother shad. In all the tributary waters of the Bay of Fundy beyond tide there should be a close season. In all the rivers of the bay resorted to by shad this closure was required because the mother shad are in fresh water for spawning purposes. A close season should be given a trial for three or four years. Some people think that a season from June 15 to September 15, but I don't agree with that. To protect the salmon an open season from July 1 to August 15 has been recommended in waters where the tide runs. Our fishing season was over for shad by about August 1, and we sent boats from Colchester shore to Petite to get the later shad. As to small shad we saw two-year old shad weighing two or three pounds at times. The restoration of the shad is of such vital importance that I would like to see a total closing down of the shad fishing for four or five years, and no doubt a great improvement in the quantity of shad would result.

Mr. ALFRED MORRISON said that shad were got between Salters Head and Bass River lighthouse on September 22 to his knowledge, and they were fine, fat shad, superior to the fish taken in summer. They were fat and thick. They had been well fed and averaged over four pounds. We floated our nets over Chiveri Bar and we got a large fish down there larger than up the bay 135 or 140 to a barrel instead of 160 or 165. I have caught many very large salmon by the score, one being 28 pounds hanging to the net by a tooth. They must therefore be there. Therefore give a year's

notice before cutting out the present shad net and require a larger mesh. The small salmon now got are full of spawn, but the reason why the original salmon of the bay is a small fish is that there were no larger breed of fish until the fry of a larger salmon were planted. The later fish were larger and a different shape. The mesh used was 4½ inch, but later 5 inch was used. We got fewer but a larger class of fish and the weight of our catch was probably as great for the season.

In continuation of the evidence taken at the sitting on August 13, at Halifax, N.S., the following further evidence was given on September 18. Commissioner S. F. Morrison, being present.

George Gregoire, Fish Merchant, Halifax, said:—I remember shad fishing in the Bay of Fundy from the time I was a boy say of twelve years of age, sixty-three years ago. In the year 1845, I was working with Mr. Tristram Halliday, of Halifax, who was a dealer in fish and the first canner of fish in this country. Mr. Halliday was a Scotsman, and had been fishing shad in the bay two or three years before I joined him. That year I had been fishing with him down to the eastward, and left there to assist in shad fishing in the bay. I arrived there on June 24, which was my twelfth birthday. The boats were there, being left there from the year before. We took nets with us. The boats were bought in New Brunswick, and were skiffs. We fished seven skiffs that year, our buildings being on Daniel Hill's property at Economy Cove. Each net was sixty fathoms long, four nets to a gang. The nets were made of fine mallet twine and knit by our own men in the factory in winter. The size of the mesh was 5 inches, and 45 meshes deep, mounted on a top rope with floats, on a third extension of the mesh. The bottom rope had sinkers. We fished at night by drifting up the bay on flood tide, returning on the ebb tide going down past our own place to low water and coming back home on the flood tide. We usually picked our nets three times at night. In these years and up to 1856-7 with the gear described, and the time spent in drifting we would kill from 400 to 600 or 700 shad in a night. They were all big fat No. 1 shad. The first year I went to fish shad we arrived at the fishing grounds on June 24, and got to work fishing July 1. At this time there was very little fishing done outside of Mr. Halliday's Company. One or two farmers had short nets and worked a little at it. Mr. Halliday also had a weir in back of Economy Point. It was hung to iron posts the mesh being 5-inch, it was net. He did not want shad caught with a smaller mesh than 5 inches, and in that way took nothing but No. 1 and No. 2 fish. We fished this weir for two years but it didn't pay, he said he lost $2,000 on it. This weir was not put in until after we went to fish about July 1. The salmon were not very plenty then, each boat took from two to ten or twelve a night, weighing from four to five pounds. The largest I ever saw taken then was eleven pounds. It was rolled up in the net. Mr. Halliday sent his fish to the Boston market. He put up No. 2 shad, splitting them and leaving the head, backbone and tail on them. The No. 1 shad he put up with the backbone in them. The year I was with him he began to dress them by taking the head off, taking out the backbone with the tail selling them as No. 1 'mess shad.' I think I was the first man on the bay to split shad in that way. From 102 to 105 of these No. 1's shad without head and bones would fill a barrel of 200 pounds. I think shad brought from $16 to $18 per barrel in Boston. We generally fished in Economy for about six weeks or perhaps not more than five weeks steady fishing. As soon as a boat couldn't bring in more than 300 shad of a night Mr. Halliday would stop fishing. I fished with Mr. Halliday seven years. I worked in the factory at Halifax with him when I wasn't working with the canners, and I helped to knit nets. After this I fished nine summers with Mr. John O'Brien of Noel. We used the same size mesh and 400 fathoms of net. I used to kill from 400 to 700 shad a night. When the shad fell off to 200 at a catch I stopped. I fished by the hundred, at $1 per 100. I have caught shad at Petite and generally got a good run of them

about there. On the south shore there was one weir below Burncoat head. While there were seven or eight on the north side of the bay. I visited some of these weirs they took a large quantity of fish, big and little. Have seen small shad in them about the size of gaspereau, which were left in the weirs over Sunday and were taken out of the weir on Monday for manure. I think weir fishing is destructive to any kind of fishing. I make this statement after a long experience in catching and handling fish. In fifteen years' experience in catching and splitting shad in the Cobequid bay, I don't think I ever saw a spawn shad. The first of these spawn shad I ever saw came from Elmsdale where they catch them every year by thousands. I don't think these shad were caught there twenty or twenty-five years ago or not to the extent they have been in recent years. I believe these shad caught in the fresh water are the parent fish. They fatten up very fast, after they go back to salt water, and feed on the worms on the flats. I think sawdust does harm to any fish and should not be allowed to run into any river where fish enter. There is far too much dirt and refuse thrown into rivers where fish exist. When I fished with Mr. Halliday, at Labrador, he was very careful of the offal and had pits dug in the ground to hold the refuse which was treated with acid. These pits were cleaned out, the contents were shipped to Quebec for fertilizer. If the fishermen threw any garbage into the water from the boats they were subject to the loss of their season's pay or fined from $10 to $50. I think the government should stop the catching of shad and salmon when going up to spawn, also when they are going out after spawning as they are worthless then and unfit for food. I want to give my opinion that the fish caught going out of the rivers in the early spring are spent salmon and not grayling as some people claim them to be. I wish to affirm that there are no grayling in these provinces. I have fished in all the waters about this country and have not seen anything outside of trout and salmon, and the fish caught in Grand lake and called grayling are all small salmon. They are darker than the salt water salmon, but that is caused by the colour of the water they live in. I think the close season for salmon fishing should not be extended later than August 15, and if any change is made it should begin earlier. We have a run of salmon appearing off this coast and caught about Portuguese Cove from the middle of September to the last of October in the company of the fall mackerel, they are clean, fat and very fine flavour, six to eight pounds in weight., which may have spawned away to the north with the mackerel. They are caught in the 4-inch mackerel nets, and would be a source of much profit to the fishermen if by local restrictions the men were allowed to fish for them with a 5-inch meshed net. They are at that season of the year far ahead of our spring run of salmon in flavour, and I wish to call attention of the department to these fish. I have never heard of such fish being caught anywhere else on this coast, and would like to send a specimen to Professor Prince, in Ottawa, for examination. I think the best way to restore the shad fishery is to let nature have its course. We could handle a lot of shad at a good price now if we could get them. I wish to state that I have seen a wilful waste of trout fry by those engaged to transport them from the government hatcheries to the rivers or lakes where they were to be deposited, by carelessness in handling and placing them in still water lakes with no outlet and where they would be devoured by trout and eels. I think much more care should be taken in this matter so important to the country.

Thirteenth Sitting.

PUBLIC HALL, STEWIACKE, N.S., August 14, 1905.

Professor Prince and Mr. S. F. Morrison, commissioners, after a few opening remarks, took evidence as follows:—

E. H. MCGREGOR, STEWIACKE, said that formerly the river was just swimming with shad. This year there were very few. The obstructions in the Stewiacke and Shubenacadie rivers were thought to be the main cause of the decline. There is no doubt that the shad are becoming scarcer every year. Teams were loaded and they were sold around away in the Musquodoboit region. Shad were barrelled, mainly green not salted, and sent to Truro market. This river was, 15 or 16 years ago, just full of shad. They were full of spawn, the spawning being May 10 to 20. This conflicts with the idea that they are mother shad of the bay. There are different kinds of shad, because shad are got in Bermuda on a hook, and John McPhee, an experienced man, says there are different species of shad, they are not spotted the same, are a different colour and heavier far. While the bay shad run 3½ to 4 pounds, the heavier kind are 8 to 9 pounds. I once saw a small shad 4½ inches long when I placed a cage by instructions from Inspector Hockin at the dam of Wm. Holmworth and John Kelly, and in 15 minutes it was full of trout and suckers and the one little shad was amongst them. It was about the middle of May. Dickey's dam was no real obstruction because it had an apron. My opinion is that shad, like all other fish, should not be taken in the spawning season.

D. H. GOODWIN stated that when he was 12 or 15 years old (35 years ago) shad were very plentiful. I often waded out and caught them with my hands about the last of June and early July. They were the coming down shad, in a 'spent' condition, having been up the river and spawned. That was five miles above here. There was no extensive fishing then, a few people caught them for their own use and got all they wanted. They were generally eaten fresh, not salted. The nets were 40 feet long and the mesh 4½ inches to 5 inches. They were set up and down stream and sometimes across according to the place. We used to buy shad full of spawn at the first of the season frequently 10 pounds weight from the fishermen. Later in June and July the poor shad coming down and no spawn in them, 400 or 500 were taken in a night by different parties within the last five years. Formerly there was no market or a very limited one and there was no reason to make enormous catches. If our shad are the producers of the bay shad it would be easy to restore them. The most vital question on this river is the shad. Shad still come up and Robert Bates caught 30 this year. The same party got 80 one night two years ago. A great catch was made at the dam three years ago (1905). Hamilton and Scott, from Brookfield, got nearly 500, one of them got 230. I don't think that the total catch this year was 500, probably not 300 shad. The tidal part of the river is muddy up four miles from the mouth to Kidd's. The water backs up to within a mile of the dam. The bottom over a large extent is clean and gravelly, and for one or two miles at a stretch it may be still water with muddy bottom. It is all pretty clear from weeds and vegetation. The shad commence to spawn when they reach clear water. They lie and spawn in sandy shallow pools. They are seen playing about briskly near the surface. The river is usually very low. I never saw small shad after hatching. Eels are plentiful and they crawl inside the fish, beginning with the gills they eat along and leave only the skin. I started a fishery with pots and you can get all you want in summer, but in winter we rig out with spears, but there was no frost and we could not keep the eels we got. That was three years ago. They were bringing 10½ cents a pound. At Milford in 1½ miles of a stream many tons were taken out. I have seen one 4 pounds, but the biggest ever got was 3 feet long and 5½ pounds weight. When salmon fishing

we could fill half the boat, bobbing for them with salmon entrails, but in winter time there are no eels in the Stewiacke. In spring we see them going down to the sea. Striped bass are not plentiful in this river, but about the first of June there is a run of small bass; they are after eels and are very voracious. The shores are lined with small eels wriggling up, some black and some white, from early June to on in August. As a large meshed net is not used, that may be the reason that not many large early shad are taken in the lower part of the river. The shad is not at all like a bass or salmon, when they strike a net they are a weak fish, more delicate and the large ones may drop out or get away. Shad are certainly scarcer than 20 years ago. I think they are very scarce this year, as some Brookfield men caught a few salmon but no shad at all. They should have got some. They got more up Forest Glen, 15 miles up. Shad go up 40 miles, but for some cause people claim that they are not going up as they used to do, probably because of dams. The river is jammed with logs so full that they are solid to the bottom and no fish could possibly get up. When the drive is on the logs may lie for three or four miles and the water is dyed like ink with the bark. The first run of salmon, about the 15th of June, are 10 to 15 pounds and they run to July. This year none were caught in June. The next run are smaller, 4 to 6 pounds, running in the latter part of August and to September 1. These last are of two kinds, the last to come being hook-bills 13 or 14 pounds weight and not so good as the others, being whiter meat and not so pretty a fish as the earlier part of the last run. They run in August and September these hook-bills. I have caught salmon in spring when fishing for trout. They will take the hook greedily but no one here fishes for them. No salmon take the fly in this river. The spring fish are poor, but will fatten up in salt water.

Oswald Coulter, of the Bay, Riverside, seven miles below on the Shubenacadie, said that quite a lot of large early shad come up in the muddy portion of the river lower down, just at the time the gaspereau ascend, but the nets used don't take them. These shad play round, but do not linger, as some think. I know both rivers, and fish are scarce in both (Stewiacke and Shubenacadie). I fished from Black Rock down and know the bay fishing. Fifteen or 18 years ago I stopped fishing in the bay and did more at farming, only fishing shad as a side show. We used 5-inch meshed net, made ourselves of 3-thread mackerel. It was 30 meshes deep and a length of 8 or 10 bunches. I'd take in a drift 25 or 40 shad, but when I began 12 or 15 years earlier, *i.e.*, 30 years ago, we would take 200 to 400 in one drift. The number of fishermen fell off to a quarter of the former number when I stopped. The price was $4 to $5 per 100. The last year I fished we got 25 cents per shad. I think that the river shad and the bay shad are two different fish; the latter are never over seven pounds, that being exceptional, whereas the river shad I have seen may be over 14 pounds; I saw one that weight. They look a different fish in shape, &c. There are two varieties of gaspereau, viz., the true gaspereau and the alewife or moll-haden, which is black inside, different shape in the head, and not so good a fish. The shad come after the gaspereau have done spawning, and are said to go up to Grand lake on the Shubenacadie, but on the river (Stewiacke) they don't go far. Some gaspereau are found in the Little Stewiacke, ten miles above here. The sawdust in the Shubenacadie gets into the gills of gaspereau, but not of salmon and shad. The pile of sawdust at Cook's mill washes away into the river.

P. A. Bartlet said he had lived on the river for many years. When he lived two miles above Stewiacke they got quite a few shad, but not very large quantities. The tides rises 12 feet.

Alfred Dickey said that at their mills the sawdust is used for fuel and none is put in streams, as portable mills pile up their sawdust. We operate by steam, but the water mills are the offenders. At St. Andrews river a little sawdust is seen yet,

but we have not operated for a year. We put up a dam—a roller dam. Fifteen years ago, not 20, we erected a dam and we put in a fishway. We came here 18 years ago, and ran without a dam for two or three years. The high water covers the fishway. It is high just now (August 15). It is not a Hockin patent, but fish get up, as the dam is only four or five feet high.

E. H. McGregor said the dam across Salmon river at Union Station, near Truro, was 50 feet high. The first year it was erected the pool below was just black with salmon, and now none are there to be dipped out. The former dam was washed away, and this dam was built less than 10 years ago. There has never been a fishway. The river has been destroyed as a salmon river by the dam and by extensive poaching, especially below the dam, where the salmon are kept back.

Milton Crowe said he was a buyer of shad. Most of those we get in June are spent fish, and they don't go down till July, when the bay men take them, although the bay fish seem to be a different fish. The bay men get the shad before they are mature or ready to spawn. Out of 15 or 20 shad the buyers can pick out a bay shad, because they are fatter, different shape, and they are a different flavour. When the water is high in the river shad cannot be caught. Three years ago I got more shad than in 15 years before.

Fourteenth Sitting.

Folly Village, N.S., August 15, 1908.

Professor Prince opened the sitting with a short explanatory speech and he was followed by Mr. S. F. Morrison, commissioner, and evidence was then taken.

The Hon. C. N. Cummings, Folly Village, said that he was 75 years of age and had all his life been acquainted with the shad fishery. All the local people used to go out upon the flats and spear shad there, and carry the fish ashore. Then small short nets began to be used. Mr. Thos. Corbett got a short net over 60 years ago and old Mr. James Johnson, of Debert, got one, but Mr. Halliday, of Halifax, came to Economy cove with six or eight boats and used longer nets and got immense catches. He had buildings at Patty Hill's Cove. He used 15 or 16 bunches of net to a boat. The mesh was 4¾ or 5 inches the same as we used for salmon. I can give to the commission my catches of shad from 1864 to 1870, and we used 16 bunches of new nets 3 bunches being sixty fathoms:—

1864	6,500	shad.
1865	9,000	"
1866	11,600	"
1867	4,513	"
1868	9,146	"
1869	5,105	"
1870	5,067	"

If fishing were poor here, our men went across to Tenecape. The inside drift off Walton was the best the men always found.

These catches for each season were made in my boat by one fisherman, James Urquhart. We sold the shad fresh at 5 cents each. In 1866-7 we paid $12 or $13 per barrel salted to be shipped to Philadelphia and Boston, the backbone being taken out

and the tail cut off. Salmon brought $36 per barrel during the American war. There was no inspection. They would strike the fish in barrels, not repack and they fell short of the proper weight and weighed 160 instead of 200 pounds. This with the large discount off made them $26 or $28 United States currency, and we got the value in flour which we brought back in our vessels. Shad were very plentiful, and I remember having caught 1,000 shad in one day in one boat in 1866. In past years immense quantities of small shad were caught in the weirs. Not only the shad but our salmon fishery needs protection. From Economy harbour up there are good salmon spawning rivers. Much destruction of salmon has taken place, and dynamite has been used. There should be two officers on each river and paid a sufficient salary to efficiently protect the salmon as well as the shad.

James Fleming, Folly Village, stated that he was 93 years of age but he desired to give the commission the benefit of his very long knowledge of the bay shad fishery. He remembered the time years ago, 65 years ago, when shad were very thick, but many years now they caught few. The cause of the scarcity nowadays is the catching of spawning shad in the Shubenacadie river. The shad here were always good firm, fat fish but I have known a few poor shad come in. In all my experience I never caught a spawn shad excepting one. I was raised here and have seen the change in the fishery.

Charles Vance said he had fished shad 30 years beginning when he was 12 years old. Shad were plenty then. Fishing began on June 15 between here and Burnt Coat Light. I only saw a large shad once and it contained very small spawn. It was the last of July and it weighed 9¼ pounds. I got it on the south shore rolled up in the net. It was in fair condition. Our catches are smaller than formerly but the size is much the same. I had a big catch in 1876 though it was not a good year. I got 801 on August 7 in one drift, the shad were late that season. There had been fair fishing for 25 years until 10 years ago, but no really good years. Most always the best catches are made on the ebb tide. We use a length of net consisting of 18 bunches and at times two bunches more. The mesh was 4 inches formerly but now we use 5 inch. I have an idea that the larger shad would drop out from the smaller mesh. It proved correct. The cause of the decline is the catching of spawn shad in the Shubenacadie and Stewiacke rivers. I don't think that sawdust can do much harm where the tide is like the Bay of Fundy tide. On the spawning grounds it may do great injury. The shad up those rivers seem to be the same as we get large shad at times here, fat good fish 5 and 6 pounds. In 100 we may get quite a number, say 10 or 12 large fish. The south shore shad are the same as here, the same kind of shad. I have cleaned great numbers of shad but never saw a spawn one. I have seen in 4 or 500 shad very small ones two inches long. As we get salmon in shad nets we would get no salmon if shad fishing were stopped for a few years. Big meshed salmon nets would not pay, we do not think that we would get enough of the big salmon.

Sargent Stewart, Folly Village, said that he agreed with Mr. Vance. He held that any restrictions should apply to other fishermen as well as the men in that locality. We do not think that catching of large salmon would pay, though a large salmon is worth several small ones. We see plenty of small salmon, but never see a large salmon jump in the bay.

The witness handed in a return. *See* Appendix 3.

John A. Fraser, Folly Village, said there was no doubt that shad had decreased. The shad are not here in his opinion to be now caught. The main cause is the destruction of spawn shad. I can't say if the feeding grounds have changed, but they seem to feed on a small grub like a sow bug. I've opened a great many shad stomachs and never saw any sawdust, but saw particles like sawdust which crumbles to powder

when crushed. Salmon are more plentiful than they used to be years ago, but there were not so many this year. They run from 4 or 5 pounds up to 25 pounds. One 25 pounds was caught this year. Salmon 15 to 18 pounds weight are taken but they are rare; 4 or 5 pounds is the general weight. They breed in all our rivers along this shore. Economy river, Bass river, &c. Poaching undoubtedly goes on, as it is impossible for one man to look after all the waters. The worst destruction is due to dynamite. As to the condition of the fish, salmon are in the best condition when taken by our men, but fall off a little in September; they are not then in such good condition. I send a few to Saratoga, but very few are shipped to the States. None are salted Trout are not too plentiful in these rivers, hence no injury due to them. I think that the catching of spawn shad should be prohibited wherever they occur. If weirs should be allowed the small fish should be liberated under a heavy penalty for violation. As a lot of small shad are destroyed in weirs. A space, say 10 or 12 feet long, should be arranged to let the small escape.

JOHN B. URQUHART said shad have been scarce only a few years, say 10 or 12 years. The most I ever got in a tide was 250; it was down at Port à Pique. I don't really go below Economy Point. The 'shad feed' is a bug which we get in our nets. It seems to float. There is more of this feed in summer, but I have seen it in spring at Five Islands. We are not bothered with dogfish, not this year. I agree with previous witnesses that the taking of spawn shad in Shubenacadie and other rivers should be prohibited. I have heard say that the seines destroy small shad, and they stop everything little and big, but I have not seen small shad destroyed myself.

LEANDER VANCE said. I agree with the others. As to the large mesh suggested I say you must get all the men along the coast to use the large mesh, not one lot of men only. The shad strike the United States coast and come by St. John, N.B., where shad are plentiful. Enlarging the mesh would let the small fish through, but it must be general or it would not be satisfactory. My average has been 100 shad a season for many years, hence I would not fish for shad at all if it were not for the salmon we take.

W. A. URQUHART, fishery officer, said that salmon go up Folly river seven miles to the falls, which are 15 feet high. Poaching is a serious matter. Four men in a wagon went by the Folly river to the bridge three miles from here. Two were in the wagon, one on the bridge with a stick of dynamite and one below the bridge stoning the pool below the falls. I talked to them and they got suspicious and off they went. There should be two officers, one in Folly mountain and one from here to the bridge; other officers should be appointed. I have seized three or four spears and had one man taken up and he was a friend, but he has been my enemy ever since. The decrease of shad is due to the destruction of spawning fish.

ALEX. P. FLEMING said he did not think that ever a salmon got up the falls (15 feet high) on Folly river. There are a number of pools and two falls on the river, but the spawning ground is below the falls. 'Forty-five years ago I saw two salmon in the pool below the falls. As to shad I have fished them, and for seven years my catches were 200 to 500 on a tide. The chief cause of decrease is the destruction of spawning shad on the United States coast and in the Shubenacadie and Stewiacke rivers. Of course our shad may be different from the United States shad. I think that a close season for two or three or four years during which period no shad should be caught would be effective. It would be no serious loss because the catch is so small the men would not feel it much. It is not too late to save the shad fishery.

Captain W. M. URQUHART said that when a boy he fished shad for two summers. That was 30 years ago, in the early 60's. Two hundred at a tide was the catch, but

previous to that large catches of 1,000 and so on had been made. There is no doubt that ours are the same shad as the Shubenacadie and Stewiacke shad, but the latter are older. I agree that traps and weirs have much to do with the destruction, as all sizes were taken, and those too small or not required were allowed to die. The weirs, &c., do not destroy large numbers of small shad, because there are no fish at all, large or small, to speak of during the last few years. In former years shad were destroyed unreasonably and millions were destroyed and the fishermen could not take care of them even though they used horses and wagons to take them from the weirs. If these shad not needed had been liberated things would not be as bad as they are now.

The Rev. W. Dawson said that he had fished a good deal in the local rivers, and the salmon were all small. The salmon got here are all grilse. Some British Columbia salmon were brought here and we may be getting the product. Thirty years ago I suggested to the government to transplant salmon, and they started hatcheries on the Restigouche, &c., and some of our Atlantic salmon were shipped west and some western salmon brought here. Grilse 3 to 4½ lbs., females, are got full of spawn. The British Columbia grilse are all 5 pounds. It seems to prove that these waters have now British Columbia salmon in them. I saw in the Cornwallis river the first 5 lbs. grilse, and before that no grilse had been known heavier than 4 lbs., on the north shore. Hatcheries on this shore would be a great thing, as salmon planted would return to this shore better than as at present, when fry from Bedford hatchery are brought here. The law against the use of dynamite should be made severe. Not a fine, but imprisonment, should be the punishment for poaching with dynamite. Because of the use of dynamite, very few young salmon are in our waters this year.

T. W. Morrison, Folly Village, said that one point in regard to the planting of salmon fry by the government he wished to call attention to. After the fry were put in the rivers we found in 1883 and 1884 a run of salmon different from those we knew here, a longer fish with longer head, and from that time they began to increase in size, and were a little coarser in build. The large mesh might pay, but some fishermen do not agree with that view. I certainly think that a close season should be enforced for shad. I have cleaned a great many shad, and not more than a couple of shad were found in a season with spawn in them. We would throw them away as garbage, not being fit for food. I have prepared a table of the catches of shad and salmon which I made in the years 1874-5-6-9 and 1882-3. The catches began to fail in 1883, and we fished for four or five years after that, but it did not pay. In one year it will be noticed that, with the usual length of net, 18 bunches, 5,041 shad were taken (in 1879).

The witness handed to the commission, Mr. T. F. Morrison's account of shad and salmon caught by him in the six years named above. *See* Appendix 2.

Fifteenth Sitting.

Great Village, N.S., August 17, 1908.

Professor Prince and Mr. Morrison, commissioners, opened the sitting with the usual formal statement of the objects and authority of the commission, and evidence was then taken.

Amos A. Hill said that when I began fishing 50 years ago, there were lots of shad, and they were not taken in the rivers because it was not known that shad ran up

the rivers then. They are about all gone now, and have been getting scarcer because of the destruction of the spawning fish. These spawn shad are the older shad of the bay. When old enough they get away from the younger ones like all other things. Later the younger ones will do the same. As a merchant in Great Village, I handled great quantities of shad. I have tried for fifteen or twenty years to get a law for the shad like that for the salmon as it is worth ten times more than the salmon. From here to Five Islands we have caught 10,000 barrels formerly but this year probably ten, certainly not twenty barrels have been taken. I have sold 4,000 barrels in a year and gave $10 to $12 per barrel down the shore and I did not handle more than a quarter of the catch. Some of the shad came from Tenecape and the other shore. They were shipped mostly to the United States, but many were sold fresh and salted, although they were principally salted until recently. The people even used to come from Shubenacadie because they did not know that they had shad in their own river. They paid $4 per 100. Their shad are large but very poor and I would not eat them. A good shad is the most palatable fish we can get and in winter salt shad is better than any other fish. We get orders in for shad every day and they cannot be supplied. I would like to see them more plentiful. We could sell all the shad we could get. It is a good food and it pays the fisherman to catch them. It means money circulated all through the poor people's pockets. Then there are the barrels, nets and the boat builders all benefit by the fishery. The best step is a close season from September 25 to June 20 next, following for a short time. As to the migrations of shad, &c., we often scooped up little fish two to four inches long in millions after the run of shad was almost over. I have seen a weir at Bass river in which multitudes of these small fish were killed, when I lived with Fulton long ago. The sweep net swept these little fish on to the beach. Most of them went out as the water went out. They were young Shubenacadie fry coming down in August or September. Salmon are increasing owing to the breeding of them. An average fisherman should secure 400 salmon in the season. If the mesh of the salmon net were increased they might not get enough fish as our fish average five to seven pounds each. The largest salmon caught in the bay that I have bought was twenty pounds. I have bought more of the larger salmon than I commonly did ranging from twelve to twenty pounds. Of course a twenty pound salmon is equal in weight and value to five fish of four pounds each. On the river here there is a pond in which there were lots of little salmon this year, and being small we thought that they were trout. The better catches of the fishermen and these small fish all show that the salmon fishery could be improved greatly, but mine refuse (slag) is put in above and comes down discolouring the water, while coal washing from the coke making discolours the water in the river. The mines do much harm by not taking care of their refuse.

George Barnes, Spencer's Point, said I am a shad fisherman and I recollect as far back as 45 years. I fished every year in that time excepting one year. The shad come into the bay to feed. Their feed is suction, but they also eat a long green worm, a sandworm and small bugs called 'shad fleas' very plentiful and thick and ½-inch long. They are greenish and we find them on the nets. My brother found and I have found a bug in the stomach the shad fed on. The largest shad I have got was six pounds in weight. The food has not wholly gone from the banks as we get it. Early in spring we may get one or two big shad coming down from the Shubenacadie and Stewiacke rivers but our shad don't spawn this year, they are in my opinion the same breed of shad. We'd like to see the shad back as soon as possible and the causes of the decline I think are:—(1) Killing the spawn fish on the Shubenacadie that is one thing. (2) Weirs which I am sure could be rigged up so as to liberate the small ones, thousands of little ones are left on the beach to rot. I don't want to catch all the fish myself, I want others to have a chance. (3) Dirt and sawdust are both bad, I have seen sawdust in the gills of a shad. Three or four sawmills on each river pouring their sawdust into the bay all along this shore is most harmful. The 'Nest' is an

eddy caused by a reef and sawdust settles there. On the flats it is two to four inches deep and the fish which used to stay don't come now to feed there where there was little current and they have now left it altogether. It might be a good thing to stop fishing all along the shore for two or three years and thus hasten the restoration. Pollution is serious. At Londonderry mines heaps of stuff is placed on the land alongside the bank, but too low. Also coal washing has done harm to the fish. Almost to Portaupique, nine or ten miles below the place where it is put in you see the coal dust. Formerly salmon were so thick you could almost catch them with your arms, but this year hardly a salmon went up the river. Dynamite too has been used. If a larger mesh were required in the salmon nets we could catch fewer fish, but I don't think enough big fish to make it pay to fish. Big shad must go up, they go up the south channel but we do not fish at the time they run.

Captain Stewart Gould, Great Village, said that it was about 47 years since he began to fish (it was in 1861). At that time shad were very plentiful and in one night 1,200 to 1,800 to a boat was a common catch. The average size was 4 pounds, or 80 to a barrel, or 135 to 140 to a barrel salted; 150 would be an average. We used much the same gill-nets as now, 18, 20 or 25 bunches to a boat. The mesh was 4½ to 4¾ inches. I fished down at Bass river principally towards the 'Nest,' near Five Islands, when I began. A reef of rocks there caused the fish to crowd in. I did not fish after 1861 for 20 years, but went to sea. They had become much scarcer in the interval and a man who got 100 or 200 to a night did well. The reason of the decline was that the spawn shad in the Stewiacke and Shubenacadie rivers had been destroyed. Also sawdust and dirt, edgings and bark, all had injured the grounds, and flats originally clean and sandy were quite black and the deposit had a very bad smell. Weir fishing is injurious because it takes all kinds of fish, small and large, whereas the drift nets give the small fish a chance. It is the proper method. The food of the shad is a small bug. It is all legs below. Salmon feed on them also. We see lots of them on the nets. The first-of-July shad, I think, do not go to spawn that season, whatever they may do next season. I have seen spawn in shad very rarely, very slightly developed. Early in the season I have had an occasional large Shubenacadie shad. Shad after spawning or 'come-backs' I have never seen in our fishing. I think that the government should have a close season, as Mr. Hill suggested, but the taking of salmon should be made uniform with the shad. Stop spring shad fishing. I have handled the shad from six boats this season and they did not amount to more than one hundred. Salmon run late of course if the water in the rivers is low.

E. Fletcher Spencer, Spencer's Point, said he had fished 40 years and the fishing has declined from thousands to fives. In the days of plenty spawn fish were not fished at all, that (river) fishing is of recent date and the fishery has fallen off on account of that. When we began fishing this year the fish were exceedingly fat. I opened the stomach and I am able to show you gentlemen of the commission the food. (Witness hands an open package to the commission.) Now rotten wood or sawdust spoils the feeding grounds. As it floats out to sea it then sinks and pools are filled with it. Twenty-five or twenty-seven shad may be now taken at a tide, the best fishing being with ebb tide at the commencement. It is so poor that the catch fell off to four or five shad a week. The rivers have been ruined. Everybody throws rubbish, old tin cans, &c., in, and coke waste has killed all the trout out and out. Such pollution turns every fish out even if there be thousands. The government should be more strict about polluting waters. Dynamite has been used for some years, and it was done on the sly last year, the men coming from Springhill. Dynamite is terribly destructive on fish, and off Noel I saw the effect once. Several charges fired to raise a body (drowning case), the first two charges throwing the fish out close by, and any 30 or 40 feet away were stunned, but those handy to the charge were dead. Twelve charges in all were fired, but after the second charge there was not a fish left. Spawning shad

should be protected, but our shad have no spawn in them. Let the river fishermen come to the bay to fish if they still want to continue shad fishing.

JACOB BARNES, SPENCER'S POINT, said that for 45 years he had fished. He had always fished with a net and boat out of here. For quite a number of years shad were quite plenty, then 10 years ago a decline began. Fifteen years ago was better than 10 years ago, but the best year was 37 years ago. It was an immense year, a boat would get 500 or 1,700 to 1,800 in a night. Right along there were scarce years, but the year following was often a good year, a full catch. For 7 or 8 years shad have gone down gradually, till this year it is the worst, gone to nothing. I believe that the shad have been over-caught. Overfishing has done it. The big catch often due to the west wind raising the tides, it makes a stronger current, and then there would be a rush of shad. I think we get a lot of male shad belonging to the Shubenacadie river. I never heard of the Shubenacadie men getting male shad. I believe that our shad are born in the bay, and the Shubenacadie river shad have nothing to do with the state of Maine, St. John river, or other rivers. In the Shubenacadie and Stewiacke few shad were formerly taken, but 15 years ago it increased to quite a business. Much harm was done by a mill-dam, which prevented the shad from going into the lakes at all at the head of those two rivers. Jams of logs held the fish and they rotted there. This spoiled the bay fishing as well as the river fishing. We have a close season for salmon, commencing August 15, but it is no good if not enforced. Some fished until October 1, but as one fishery officer has to patrol the whole area and fine all who fish after August 15 he cannot do the work, no man possibly could. To stop salmon fishing on August 15 is ruination; they come later by two weeks than that, or even more. By the time we get our gear paid for we have to stop. The market wants all our fish after August 15, because other places cannot get fish, and we would have a good sale late. The season for both salmon and shad should be August 25 to June 20 following. Some would like September 1 to June 20. There would soon be plenty of shad if this were done and the new law enforced. I do not think that the size of salmon has increased on the average. I got as large a fish 20 years ago as I do now. Salmon fishing seemed to be less this year, but some years they are followed up too long, and there are no officers to stop the illegal fishing. Large salmon are very few. Our nets are the same meshes as shad nets, and I can't see how it would work to increase the mesh; the salmon gear, worth many thousands of dollars, would be thrown away. We could not fit out new gear for what few salmon of large size we would get. The amount of fishing has decreased, as there is not one boat now to every ten there used to be. The weir has been the great injury, as when shad were plentiful thousands were caught which were no good, but they were split and called No. 2's. They were not fit to eat. Thousands were left on the beach, small ones that the tide left high and dry in the weir. I do not say stop weir fishing, as all fishermen have a right to live, but there is a right way to do everything. The drift netting is the right way, as the shape of the shad is just that of the mesh and small get through. I used to split shad from two or three boats, and I always found them to be male shad; I never got more than one or two spawn shad, and I split more than other men, I claim.

SMITH HENNESSEY said that his experience of shad fishing extended over 15 years. I know Cook's weir, Highland village, and shad fishing is so poor that it caught nothing, not more than a hundred shad all the season. A weir is costly to build: the labour would amount to $140 putting it up, and there are the stakes and brush. I remember 1,500 shad in a season, followed by a spurt when 3,000 or 4,000 would be taken, about 1898, I think. Next year there was no catch. Thus it varied. The gill-net is the right method, as it does not destroy so many fish uselessly. I agree with the previous evidence as to taking spawn shad and the close season, and the injury due to sawdust. Respecting the size of salmon, I have got a few bigger salmon than I used to do, but I have new gear.

Sixteenth Sitting.

VICTORIA HALL, BASS RIVER, N.S., Aug. 18, 1908.

After the customary opening remarks by PROFESSOR PRINCE and Commissioner MORRISON, the following evidence was given.

Mr. GEORGE LEWIS, BASS RIVER, stated that his experience extended over 40 years. He began when he was a mere boy and stopped 35 years ago. He fished the drift net and the weir or brush fence. Shad were fairly plentiful and catches of 1,000 were made at times by our own boys; 300 to 500 was a fair catch, using 400 or 500 fathoms of net, 5¼-inch mesh. Holliday's men from Halifax used short nets, 200 fathoms, and small boats and got 200 to 300 which was considered a good night's catch. We then made smaller meshed nets, 4⅞ and 4⅝ inches. The shad we caught ran 104 to the barrel with 5¼-inch mesh, but 170 to the barrel with the smaller mesh. We never fished much below Moose Island. The largest catches were made between Economy Point and Moose Point. I had an interest in weirs and we got herring, gaspereau, a few stray cod, seldom any bass generally in May or early June. Drift nets were used in the latter part of June. Hardly ever was a spawn shad taken. Usually a spawn fish was a big fish, and when cleaned poorer than the others. We quit very early in August. We never saw any racers or come-down shad. Late in the fall the shad would be thick and fat, say in September. We never took any St. John shad. A few St. John men came here to fish after I had begun, but did not do so well as the local men. Respecting small shad I have seen them about the middle of August in big schools in a weir. They were 2 inches or even smaller. None have been seen by me this long time. There are none to be seen. For 20 or 30 years we have heard of the killing of spawn shad up rivers. I am afraid it is too late to bring the shad back, because it will be hard to find the seed. Shad were too much destroyed formerly; I remember one of my boats taking 1,600 in one night. Hatcheries would be good. Sawdust, obstructions in rivers, dams, and too many nets have ruined the shad. A total prohibition of shad fishing would later benefit all. If the men could be satisfied to let the shad have a chance all would benefit later.

THOMAS B. FULTON, BASS RIVER, said he had known the shad fishery for nearly 50 years. Shad were formerly pretty plentiful, for I have taken 1,000 in a drift net of three hours. I have fished a weir and there is a rise and fall. Four thousand or 5,000 taken in a season, but not 200 have been taken in our weir this year. Often we noticed a big catch up the bay and a small catch below. The causes of the present scarcity of shad are: (1) the killing of the spawning shad; (2) sawdust on the spawning grounds; (3) sawdust damaging the feeding grounds. The food of the shad, a dark bug-spink on the sand which forms a little mound; it feeds also on dark insects about the rocks; food seems scarcer, I don't see as much food as formerly; (4) loss of fish dropping out of the nets owing to rough weather. I have seen the water blue with small fry formerly, but now there appear to be very few of those small fish. Dogfish are not more plentiful than when shad were abundant, nor have the shores changed physically, so the shad cannot have left on account of such causes. The weir is expensive, and so much labour in building and maintaining it that our weir never pays. It has 1,200 or 1,500 stakes, and is provided with a wire gate to let out fish when desired. We get very few salmon, as they get over the top. I have taken two barrels of salmon in a season, ranging from 5 to 10 lbs. I think we get more large salmon. We get a 20 lbs. salmon rarely entangled in the drift net. Salmon used to go up Bass river, and all the rivers along this shore, but sawdust and poachers have depleted them.

RUPERT FULTON said from being a boy I have known the shad fishery. I have cleaned more shad than any one else on the north shore. I have fished both the drift net and weir. Forty-eight years ago I fished for myself. I fished the big weir, which for 80 or 90 years has been fished except for two years recently. Long ago the shad were speared on the flats, then a mud weir close to the shore on the flats was tried; 300 shad were got in it. Big catches were taken in sweep nets; 6,600 were caught at high tides, indeed the sweep net could often not hold them, 10,000 or more perhaps at one haul, and we had to then let the net down and free some. I have known 3,000 or 4,000 taken between 2 and 6 p.m., and 200 again in the next morning when there was a gentle breeze from the west, a calm flood or a breeze on the ebb to prevent the fish coming too close to the top, as being only five feet high, they might pass over. Shad have the habit of staying close on the bottom. Hence a boat might drift over them and get six shad only, while we would have a catch of 2,000 in the weir, the boat being in 2½ fathoms the drift net being 11 feet and the weir 5 feet from top to bottom. The shad were feeding, a spring or little mound of sand with a bug inside on which the shad fed, and plenty of the feed meant plenty of shad. In the boats we see lots of brown bugs with numerous feet, they are on the stern sheets, also a mud worm which creeps about. The shad's stomach is small and hard, like a gizzard which grinds the food and digests it rapidly. The quantity of shad has declined but the size has kept up. The causes I think are (1) spawning fish have been destroyed that is the chief cause. (2) overfishing especially the fishing dragging on late in the fall. The remedy I would suggest would be to prohibit the catching of the spawning fish in the river as one shad means $6,000 here while the river fishermen get 30 cents for that parent fish. Prohibit shad fishing from August 15 to June 15 following. I think I know how the river shad netting began. I knew a farmer on the Lower Stewiacke who speared a few shad in the river using a pitchfork. He married a Bass river girl and she made shad nets of the larger mesh and taught them how to net shad with a net and punt. The mesh would be 5 inches probably. That would be 42 years ago.

D. STARRATT said that he agreed with the evidence and wished to add nothing to it.

WALLACE W. MORRISON, of Economy, said I have fished shad for 60 years. For 2 or 3 years I used a boat and net, but principally carried on weir fishing below Economy Point. It was deep water and a rapid current with an eddy most favourable. Shad feed on the ebb tide on shrimp and flat worm 5 or 6 inches long. Thirty-eight years ago big catches were common, thus at that time 70 barrels were taken in 7 nights, 140 shad to the barrel. Twenty-five years ago the shad declined so that I quit my weir got so few fish. Shad come on the top at high water and go down on the ebb feeding on the bottom. Up above here it is muddy and below at the point it is clear water. Shad are timid and a weir through which a sheep can go will frighten them away. Shad run to the top of the bay and work down so that the upper nets and weirs get the first catches. I never got one spawn shad in all my big catches and not a dozen poor thin shad in all my years of fishing. The fish in my opinion spawn in the Connecticut river and migrate here to fatten up. Jones, of Boston, told me he thought their shad poor and they were United States shad. Weirs don't scare shad as what they catch they keep, and my weir must be very loosely made in order to let the strong tide through. It is in a sandy location, but for five years lately I have not fished it. For many years I got a good many herring in it, but no salmon. Drift nets and dog-fish may have frightened the shad away. If the mesh were enlarged to 5 inches it would ruin the fishery. A 4¾ mesh, or ⅛th larger, nearly 5 inches, would not catch No. 3 fish and will secure and hold the big shad. When older the net shrinks.

Captain E. Thompson, Economy, said I fished shad when I was 17, that was over 30 years ago. The catches then were not very large. My experience was at the Long Green weir, Lower Economy. It was set again this summer after being out for some years. It takes nothing to speak of, chiefly mackerel, quite a catch, also shad, herring, a few cod and gaspereau, skates, flatfish and seldom a sturgeon. It used to pay 25 or 30 years ago we got good catches. The coarse useless fish we hauled up to the field for compost. There were three owners at first, later four. We had the old way of dividing the catch, viz., 3 piles and I got ½ of the 3rd pile, so I got one-sixth of the catch of the weir. It got the name because when building the weir the trees were in leaf of which the stakes were made when they were put out first, and the weir looked green. I went away in 1880, and I don't now fish at all, I have a farm. I would like to see the shad back, and as there are practically none it would not be a serious loss if the fishing was shut down. I am hopeful if something is done by the government the shad can be brought back. I have not seen young shad in the weir. We always had a gate in the weir, *i.e.*, we lifted the brush up at the head of the weir. There was always water in it, and when the tide was coming in all the large shad sometimes went out and some small left in.

Charles Fulton said he had been boat fishing for 30 years with the loss of one summer. The shad fishery has decidedly changed. We always had good and bad years in succession. A poor year would mean, say 100 shad in one drift or 6,000 to 7,000 in the season, but in a good season we'd catch from 20,000. Then poor years came, and our $200 worth of gear was no good; it was not worth while to fish, and we did not. For a long time I expected a good year would come. It is really beyond remedy unless some good measures can be taken. The cause of the scarcity is hard to determine but I think (1) the slaughter of spawn shad, (2) overfishing, too many boats, they are so thick they are like black ducks. (3) Too much net; the bay is full of nets, some boats have three-quarters of a mile of net (500 to 600 fathoms, 25 to 30 bunches) of a depth of two fathoms, each 45 meshes, some having 48 meshes, of a mesh of 4⅜ and 4½. I have counted 60 to 75 boats from Economy Point to Port à Pique, a beautiful sight; indeed there might be 90 boats, some have counted that many. There should be a standard length of net, say limiting a boat to 300 fathoms (15 bunches). Limit the number of boats, allowing one boat to a man. When I began fishing we got large shad as soon as the nets were put out. After two weeks' fishing the shad fell off and fishing would be slack; then we would get first-class catches of a new kind, very greasy shad and different in colour. Once I got on the 10th of September 400 shad, the most beautiful fish I ever saw, very plump and fat. I favour six weeks' fishing, say from August 10 to July 1 no fishing whatever of shad to be allowed. You can't please everybody, but that would save spawn shad. That would meet the abuse in the Stewiacke and Shubenacadie. Sawdust is not harmful, and near my home there are banks of it; every tide carries it in, and I have never seen such fine trout as the boys caught this year within 1½ miles from the mouth of the river.

Beveridge Fulton, Bass River, said I have an interest in a weir; it is the Big Bass river weir. I farm, and as the fishing has declined, I think something must be done. The weirs cannot be blamed, as there have not been any weirs of any account for five years, and the shad should therefore be plentiful, if stopping weirs is a benefit. The small fry went through the brush of which the weir was built. We saw plenty of small shad years ago. Some think that gaspereau are small shad and some called them that. But there are spots on the side and the head is different shaped. The brush in a weir last two years if we take it out, but the ice carries it away if left in. We had a gate in the bosom made of ordinary poultry netting, and this gate we opened on Sabbath. As the shad are now over we don't look at the weir. There is water always in it, over a foot at any time, over a half acre. We must use quite a large net to sweep the catch of shad out of it when shad got in. We got no salmon

in it. I agree with the evidence given, but the only hope I have is to close the shad fishing down. Simply closing the river fishing and allow bay fishing is not sufficient to do any good and give the fish a chance to make a new start. If the men who now fish counted the time and the cost of what they would have lost by continuing fishing under present conditions they would agree with me. No one is really dependent on the shad fishing. As to sawdust, I have seen it on the flats, deposited there by the tide, and on the spawning grounds it must be very injurious. It injures trout. On Little Brook, where I have a mill, I have seen dead trout, proving the injury.

Dexter Hill said that his information went back 80 years, as his father and grandfather were fishermen. They speared the shad with pitchforks in pools left by the tide. Sixty years ago the Hollidays, from Scotland, had a schooner with nine boats and short nets drifting. Later, weirs were used. All the gear was improved as years went past. In April the weirs were put in and a spawn shad not often was got in them; they were very seldom taken. A No. 2 shad will go through a 4½ mesh. it only takes a No. 1 marketable shad. Though we rarely see a spawn shad in April or May we were convinced they passed up, it must be in the channel here and were caught above in large quantities. They began up there in Shubenacadie fishing for these fish 25 or 30 years ago. In a poor season it was profitable, as we easily got 5,000 or 6,000. Some years 18,000 to 20,000 shad were taken, that was in good years. Even our poor years here were really profitable good years, but there's not a half barrel of spawn shad been ever taken on all this shore in a season. About 20th of June our fish come, and we closed down the weirs and went out in the boats for six weeks, but stopped because we only got 50 or 60 in a night. Probably we did fish too long and too much gear; 26 years ago the shad fishery declined, then 12 or 14 years ago it was good for two or three years, very good. We found the cause of the failure to be the destroying of the breeders, and of course the supply runs out. I won't really say it is, but I believe it is the cause. We petitioned the government to stop the catching of the spawning fish, but we really got no answer. Then we asked for a closed season and again no answer. Perhaps it was the men up the bay shore influenced the matter. They likely said, 'Don't stop us, stop those below,' hence the government let it drop. The shad made straight for the head of the bay so that there was good fishing above, then later we would get fishing lower down. A straight west wind was always favourable for our shad fishing. Shad return just as swallows and birds return to their own haunts, hence we said the fish are hatched up there and we depend upon those spawning fish up there. Now we have no fish. Likely there are more causes than one. What will restore them? It is no use to stop the catching of spawning shad. It looks hardly reasonable to say to the Shubenacadie men 'Stop your fishing and let the others down below go on Scot free. To close all down seems a cold-hearted way, but if the commission reports in favour of several hatcheries but requiring the closure for two or three years we could then help by all being closed down. In our petition we asked for hatcheries to restore the shad that way. They have proved good in other places and should be beneficial here. I've seen lots of small fish but never saw one stranded or destroyed. Our weirs can't be harmful in that way as except the Mersey, England, there is nowhere such a tide as here, viz., 60 feet, and our weirs must be open with such a swift tide. We made great hauls in old times and caught No. 3's among the rest. I think our bay is full of fish as I think they grow fast. Reasonable men would not say a word against closing down if it is necessary, and I would sacrifice my nets and gear. I have fifty bunches of net lying no use now as well as three or four weirs, and I'd be willing. I want to see something done even if it does tread on my toes. You cannot please everybody gentlemen.

James A. Fulton said: I am of the same opinion as the last witness, something must be done. I am of opinion that the shad brought $100,000 to the shore between

Truro and here, and that is a low estimate, but now $2,000 would cover it. I was born alongside the fish and caught them and ate them. Shad seemed always plentiful, we were always sure of a good catch, and I never heard tell of failure formerly. With one weir 500 to 5 or 6,000 were taken on a tide. I went down to a small weir with my uncle in 1878 and got 5,000 good shad. On the tide fish seemed thick all over the bay. In the season each of the boats would get 10,000 to 20,000 shad. Then they fell off and most people got disgusted and went out of fishing, and to-day those in the business are losing money. Why there were thirteen boats out of our brook then and now there is only about that number in the whole bay. There would be 100 boats making good catches when I was a boy, 1,000 and 1,100 shad got by each boat in three hours drift in the nest and sawdust was pouring down into that spot. So there must be something more than sawdust and weirs to account for the decline. The whole trouble is on the Stewiacke and Shubenacadie. Give us hatcheries and close down everybody. If you closed down you'd soon fill the bay without hatcheries. We don't now see the great schools of little shads two or three inches long, which we used to see in August. Late in the season we'd lift 1,000 with the dip net, they had little black spots on the side.

Edward Fulton, Bass River, said:—I do not think that any one could call this Shad Commission a failure or as some have called it a farce. I felt that it was the very thing required. I want to say two or three things. The operations of our fishing here can have had no detrimental effect because no spawn shad were ever caught. I don't wish to cast any blame, but the ordinary fishing has not fished out the shad. Now two years ago an Order in Council was passed to stop fishing for three years as a result of much careful thought, but by some people's work it was upset. A few people would have lost a little but there would have been a tenfold return in a few years. A few people not representative had too much influence in reversing the law made wisely. Sawdust did not kill out the fish as there was ten times more of it when there were lots of fish. On both sides of each stream there were two or three mills and none were careful of the sawdust. Here at Bass river it is used for fuel.

The decline of the shad is serious in many ways. Consumers of fish suffer loss now. Formerly no charge would be made for a shad on the shore they were so common. But fish generally has advanced 200 or 400 per cent and the price of shad has gone up three or four times while salmon is four or five times its old price. Every family had a barrel or half a barrel of shad to see them through the winter. This famine of shad has added greatly to the housekeeper's expenditure. There is no mystery about it. Some people think it a mystery, but we have been burning the candle at both ends as Commissioner Morrison said and it is burnt out. You see the date the Shubenacadie men found out how to fish shad, and from that rate, within a limited number of years, the decline began. This bay area is the home of the shad. With planting and with protection here they should be in plenty. If the shad be restored how to prevent a recurrence of the scarcity will be the question. The matter should be treated as a public domain, and regulation and license should be enforced. No man should have ten or twelve boats in the fishery just because he has money, but the poor man with small means to buy his smaller gear should not be crowded out. Just as no one can go and cut timber on Crown lands, so that a wealthy man can't slash down all the timber. Public domains like the bay flats should be guarded in the interest of the public. Forty years ago big fishing began and now it is so played out that at Economy there is not one shad boat. The rivers have been overfished and the natural supply cut off. To the dealer the decline made great havoc with his business, it was a calamity in our financial affairs on this shore. We can hope for nothing unless there is an entire cessation of the destruction of fish and after that the proper regulation of the annual catch. Though I never fished in my life my grandfather fished shad but it is the concern of everybody. A radical measure only will work any real good. The loss to a good many by closure will be a mere trifle, and the government might

compensate the dozen or so who have gear that would be useless. A few thousand dollars would make that all right. Be heroic in the matter is the suggestion I would make to you gentlemen of the commission.

Rupert Fulton recalled, added that some men neglected their farms to fish shad. My father had a quarter share in a weir. The price of shad was $10 per barrel. I offered to take them to Boston and sell them. Buyers came to me as thick as at Bass river and $14 was offered me. I sold them quick and got a cheque on the State Bank for $1,400, and I got it in half sovereigns.

There was handed in a memorandum addressed to the commission on the matters connected with the shad fishery under investigation (by Fishery Overseer J. W. Davidson) Appendix No. 2.

Seventeenth Sitting.

Custom House, Canso, N.S., August 22, 1908.

After the usual preliminaries evidence was then taken as follows:—

Captain John Wells, Fish Merchant, White Point, said that a few shad came in when the July herring came in years ago. Quite a few shad were got. During the last eight or ten years there had been no July herring and it has been a rare thing to get a shad. I have put up as many as 600 barrels of July herring and many others did the same; but it has been difficult to get 60 barrels during the last eight or ten years. The shad got entangled in the herring nets so they must have been plenty or none could have been got accidentally in that way, the mesh being 2¾ inches. They were set three or four miles off land, on the top of the water. Later we moved the nets in and sunk them to the bottom in ten or twelve fathoms of water. The herring were fat and settle on the bottom so that we would get for four weeks on a stretch one or two barrels to a net in a night. We got quite a catch of large herring 10 or 12 inches long and a few larger. Out of 25 barrels I got two barrels of large, 10 of small and 3 barrels of smaller, No. 2's. I cleaned any shad taken and there was no spawn in them I think, but am not sure. They were 20 inches long and eight or ten years ago we got quite a few of them. They were not fat enough to fry in their own fat and we used pork when frying them. They don't come in just as the salmon don't come in on this southern (Guysboro') shore. Fifteen years ago we'd catch lots of salmon in our traps, but now we don't get them. I have not heard of one salmon in a trap this year, and our locations are former salmon net locations. For three years I have fitted out boats with mackerel nets, 4-inch mesh, hung on the head and on the foot the same way, hung on the mooring, and have taken up one-third. When we set nets as we do, it forms a bay or semi-circle of light twine. Five or six miles off shore they took two salmon, 20 and 26 pounds weight this year. No set nets have been used for salmon for four years. The herring which later strike our Nova Scotia shore here, first school in April

on Sable island ground. The nets which took herring that were in the bays have to be set a little later on the outside as the herring spawn on the edge of the shore, three or four miles off in 30 fathoms of water. The Atlantic cable on the bottom there is covered with spawn, but the nets are not sunk to that depth. The herring have given us a berth now and don't come in.

Capt. ALEX. M. ROBERTS, CANSO, said that there were no shad taken until about 22 years ago. They had no means of taking them, but in spring from May 20 to July 1 some were got in the traps for a few years. They seemed to me to be fat when we got them early in spring, and were 7 pounds weight in some cases. I have shipped shad to Boston, salted, split and dressed like a mackerel. My biggest year I shipped four barrels, 200 pounds each. Beamen Bros. shipped them from Boston to New York, the 800 pounds; that was 17 or 18 years ago. Since then few shad have been seen. In 1907 I got about a dozen, but this spring have not seen any. They moved along with the mackerel schools. The salmon we get are 9 to 20 pounds, but all sizes are got; we don't see very small ones.

ANGUS A. ZINCK, CANSO, said that 14 years ago he came from Lunenburg. They saw occasional shad, and on August 18 he got nine in a trap on Tittle island, close by Canso. One seemed 6 or 7 pounds weight, but 4 pounds is the average. They were poor and thin. A. Wilson & Sons, of Halifax, bought them. Along with the nine shad we got 100 mackerel and some squid. The shad were probably moving westward with the mackerel, which were moving up the shore. The men got them when they were getting mackerel. In 1907 I got some earlier shad, probably in June, but some may be got one day and then not for a fortnight. They are so few we hardly bother with them. The later shad are quite fat, and I would as soon have it as a salmon on my table. The Halifax people do not seem to care for them, probably because they were thin, poor shad. During the last 10 years not more than five or six barrels of shad taken here.

E. K. GOODWIN said that he got one or two shad early in June, but 25 years ago there were more of them. I think we have shad here, but no one fishes shad or takes them. We may get small numbers early, first part of May, and then in July and August we would get a few again. Shad are a shy fish, and I have seen them playing back and forth along the twine of our traps. They will not lead, but keep clear of the trap. Gill nets are too small to mesh shad. Forty-five years ago I remember as a boy at Pubnico, western Nova Scotia, ox carts were taken out on the flats and large schools of shad left by the tide were taken. Hundreds of barrels perished and no one took them away. That was, I think, in June. We have got here a larger, coarser shad than those we got on Pubnico flats. Eight or 10 years since I got shad with roe in May or the first part of June in a trap. Fourteen or 15 years ago we got 14 or 15 barrels of shad one season; but during the last 10 years not more than five or six barrels have been taken. Before I gave up fishing where we got the shad we gave them away. I sold four or five at 25c. each, but had to give the others away.

Captain J. WELSH, WHITE HEAD, said that he had fished haddock nets 5¾-inch mesh, mackerel nets 4-inch and salmon nets 5¾-inch mesh, and shad were taken at times, chiefly at White Head and some at Dover. Mackerel nets take the small-sized shad. A good many have been taken on the Cape Breton side of Chedabucto bay. The traps take a few. The other day seven thin, spent ones were taken (middle of August), and lots of very large ones were got this spring in the haddock nets, which the men had made larger mesh, not 5¾ and 5⅞-inch mesh, but 6-inch mesh. They were four, six and seven pounds each. The head being small, they meshed. In spring they are plump. I said, 'Those fellows are all spawned,' when I saw the

very different looking fish on the wharf the other day, taken in the traps. The shad here may spawn in Gaspereau brook and the head of Dover bay. I have got 15 or 20 shad close inshore, taking them in the drag seine for gaspereau and for June mackerel. The seine is 140 or 150 fathoms long. Often we get salmon too, generally one moving along by himself. This spring a 28 pound salmon was taken with fresh herring bait on a haddock trawl. We took three salmon this season, one 17 pounds weight; we gaffed as it went by near the surface; one was got on the salmon net and the other was on a haddock trawl. Occasionally we got a very fat shad in the fall. The gaspereau are fat in the fall and worth eating then, but in spring are poor. We got them in the mackerel nets, and in the fall I would prefer a fat gaspereau to a mackerel.

Clem Whitman, of the firm of A. N. Whitman & Sons, fish merchants, Canso, said that shad were not regular, and were of small importance in the local fisheries. Eighteen hundred pounds were caught in 1905 in the haddock nets in May. They appeared to be coming from Cape Breton. We paid the fishermen 5c. per pound for them. They were four or five pounds each. Those we got were probably only part of the total local catch. Some Montreal fish firms got news of the take of shad and at once bought them up eagerly. We sold them for 7c. or more. In June, 1905, we got a few, 26 pounds total weight.

Eighteenth Sitting.

Drill Hall, Middleton, N.S., August 26, 1908.

There was a large attendance when Prof. Prince opened the sitting by a short address from Mr. S. F. Morrison. Evidence was taken as follows:—

Mr. Sydenham Howe said that 18 years ago a man could get 170 shad in one net in the Annapolis river, but no one got a higher catch than 30, say three to six years ago, and for two years no one's catch was more than 10 shad. I have seen very few shad playing about in the river as they used to do towards evening. They used to be taken at the mouth of the Nictaux river from the end of May to the 15th of June. The water was too high before May 15. They go up both rivers, and I have seen them one mile from the mouth of the river, but old people said they went a long way up. No doubt dams and sawdust have stopped them. There was a two years' prohibition, and no nets were supposed to be set, but nets were still set. The Annapolis river is full of nets. Some are set right across the river, *i.e.*, fixed gill nets. The shad spawn a mile or more from the mouth. It is a beautiful salmon river, with good pools, and the upper part, I am told, is very good. The Nictaux salmon are very gamey, but not large; few exceed 10 pounds. This year one salmon 18½ pounds was taken by fly. In the Annapolis river a salmon of 22 pounds was taken in an illegal net. With very little trouble it could be made a famous river, as Americans inquire very much as to where salmon fishing can be got. They pass this district to go to Newfoundland, giving us the go-by. One United States angler brought $100 and another United States sportsman nearly as much. The best class of sportsman would be brought here with their families. It is no great deprivation for our people to not get a few salmon which the anglers would take; local people don't eat much fish. It is shipped away. Not more than 30 fish taken by fly in a season from Laurencetown up to Nictaux falls, but five times that number must have been netted, at a low estimate. At Lequille they dip them, and at Roundhill, where they have three days given them for dipping. I hear that drift nets are used in the tide waters. On

account of the dams there can be no success with efforts to stock the river with fry. There should be a better patrol, as now two men are supposed to watch from Paradise to Kingston, the county line, and Nictaux is the same. Salmon are dipped when lying under the dam, and miners use dynamite at the falls. The officers must have better pay, as they incur the ill-will of their neighbours and have a hard time if they do their duty. The legal season is from February 1 to August 15, which is right on the Medway, but on this river the middle of April begins the run. On August 1 I got a salmon in most perfect condition. We thus lose two months' fishing, and we think that there is a run of large fish in September and October, therefore cut off this spring and give us a month or six weeks in the fall, like the spring and fall fishing of Scotland. There is talk of a new dam being built at the falls. The Torbrook people are talking of it, and there should be a pass in it.

E. S. Dodge said that the fish in the local waters were shad, salmon, bass, gaspereau, frostfish or tomcod, trout and sea trout up to Paradise and above there brook trout or river trout. Frostfish are dipped at Laurencetown and barrelled when they spawn about January 1. The first shad are usually taken about April 10, they are 6, 7 and 8 pounds weight and commencing to swell with spawn, the first shad being females but the next lot are males, 3 or 4 pounds, good firm fish and as good as Scott's bay shad before they come into fresh water. The females are lower in the water and the males we get near the top of the net high in the water but they make no disturbance in the water when spawning. A run of males and females together takes place. Low water stops them at Paradise, but a freshet brings them up. The fish are black on the back on first running in but later they are paler. The shad of the Avon and Gaspereau go to Scott's bay. I once got four barrels salted and packed at $1 per barrel, the people could not handle them they had not the salt and used a quantity for compost. They were hauling them with a hoist just as they lay dead in the weirs. It was 40 or 45 years ago, I was 15 years old. It is unjust that the men below should fish all the time and above the weekly close time Friday night to Monday morning be enforced in the river. From May 10 to June 15 alone is netting allowed in Annapolis river from Paradise up to the head waters, and from October 1 to March 31 no trout, &c., can be taken. In the Annapolis river there is a shad spawning ground 2½ miles above Middleton. On May 24 I saw a school of spawning shad in a nook where the river used to run, it was 5 feet deep and very clear with a fine growth of weeds. The bottom was gravel and their backs were out of the water. There must have been four barrels of them. They were so thick they rocked our canoe with their backs. Above that, they spawn in the main river, but it is filled up with gravel washed out from the bank. I have seen young fish hatched on the grounds where Mr. Finlayson was getting his shad spawn for the government hatchery. They must have been fry of an earlier run of spawners. Some shad spawn three miles below here a fine ground below a good fly fishing pool. On the Nictaux about one mile above the mouth I have seen spawning fish by the hundreds far more than in the Annapolis river. Formerly a net would take 100 to 150 in one night. Two years ago they were pretty plentiful. One man got four tons and he was only one of four fishing. In the river about Middleton all fish, three years ago a standing net below the spawning ground I speak of scooped 90 shad at one haul. A set stationery net fished below and a gill net got most fish. We got 100 here for spawn which Mr. Finlayson required. Shad used to go up 15 miles. Up at McGills it is clean gravel and salmon went there and gaspereau. Obstructions are the worst thing. They are (1) Laurencetown where the shad were stopped 25 years ago, so that none were found in the river. It was washed away owing to a fish-pass it is alleged placed in it, and the government were sued for damages. The foundations are there yet. A plank sluice was put in for a fish pass but it passed too much water down the owner thought, so the government men came and built one through which no water ran except during spring freshets. It was a Roger's pass. (2) A dam 3 miles below the falls over which salmon get but no shad. It has no fishway.

(3) A dam at the Nictaux falls which is 10 feet high and was always an obstruction. The fishway put in was useless because not enough rock blown out below to give the fish a start, in attempting to get up. (4) Alpena dam, which has a fishway and the mill, is abandoned, the gates are now always open. (5) At the lakes there are dams to drive logs. For two years owing to no log driving taking place the river became dry the water being held back and no shad spawned below on that account. Shad go up by diagonal 'shoots,' but come round back so are netted above the net. A net half-way across will catch more shad than a very long net; but salmon feel along the net to get by. Fishing is more general now. Six or seven men fished thirty years ago, but now everybody who can get room tries to catch shad. There were not so many nets formerly. From Brickmaker's Building to Taylor's Falls, *i.e.*, in four miles there are twenty-seven nets, but more the year before 1907. Some shad get up the Annapolis river because they ascend before the nets are set at 10th of May. On the 10th to 15th June, we get some coming down. A mistake was made about the close season when the Board of trade urged a season by Order in Council and the time May 10 to June 15, is too late, the shad are coming down then and are not fit to eat. It should be April 1 to June 1. One man netted 26 or 28 each night for the last two or three nights' fishing and must have been the shad I saw spawning in the side channel I spoke of. Quite a lot of salmon stay for the winter, and I don't care about the fall run of salmon in October and November as they are the fish going to spawn here and stay the winter. Spent salmon are very large fish when we see them in spring. I got one at least ten pounds, though in 'slink' condition. They are got in nets but are not fit to eat. A lot are taken but as a rule they are liberated as they can't find a sale. These spent fish go down early in April as soon as the ice leaves and not later. Gaspereau are dipped by Indians in Annapolis river and Lequille. Formerly they dipped them at Nictaux Falls. A lot of bass taken as far up as Paradise in nets. Plenty are caught in the tide five or six pounds weight. Some farmers set a net wishing to get a little money out of it. The way the river is now fished is ruining the whole valley and gives little remuneration to those fishing. Angling is destroyed. Time and again I get letters inquiring for fly fishing, but I cannot guarantee a fish to any visitor. One visitor got a salmon and he was satisfied but this year the fish were scarcer and I could not advise the visitor to come. No logs come down except a few on the Nictaux. Some are rafted down but there is no great injury on that account, nor does mill-rubbish cause much trouble. There is no rubbish nor sawdust to speak of in the Nictaux. It can be taken care of without trouble; but at one time they were to lazy to wheel it out and dropped the sawdust in the river.

W. M. Bailey, formerly fishery officer for the Annapolis and Nictaux rivers said, I have been on the rivers for forty years. The decline is very serious, indeed not one-hundredth of the fish they used to produce is to be got now. The causes are mainly three (1) Overnetting. (2) Obstructions. (3) Sawdust. From Tupperville on the west to Kingston on the east, there are a great number of set nets, *i.e.*, spring or pole nets, bag-like in shape for taking bass and salmon as well as shad. The net is 20 feet deep, its length 100 to 130 feet and the mesh is 3½ inches of good strong salmon twine. It is used in muddy water and two punts are used when fishing. Some nets are licensed but others are not licensed. They are used in tide water and can be fished three hours out of each tide. There are a few brush weirs down the river below Belleisle. We used to see lots of shad in the river and one man took seven cart-loads at one tide at Roundhill in the month of August, fifty-two years ago. A cart-load would mean 300 or 400 shad. They were fat shad wholly different. They had got into the wrong river and were not the same as we get. They feed on bugs and animalculæ till the last of July, and then the schools work out slowly. Sawdust ruins spawning grounds killing the eggs causing fungus growth which spreads. For two years in Lequille river the gaspereau were blocked in the fish-pass there; and they died in bushels about the lower dam, they rushed up so fast. Fishways are very successful

when properly put in. I know it, and also that salmon, shad and gaspereau can go up the same pass. The best remedies are stopping all nets in this river for five years, and the propagation of salmon, shad and trout. It is the river with the largest salmon run and for one that goes up Lequille there are 500 go up the Nictaux river. They ascend even east of Berwick because I saw one, an eighteen pounder, in the last week of September, and appeared as full of spawn as it could be. It was 21 miles east of Middleton and five or six miles from the head waters. I know that shad eggs are so delicate and tender that you can't move them far, but you can transport the fish they are tougher than even salmon. I never saw a year when shad were so very scarce. Shad come in about April 12, and commence to spawn May 5 to 12, and continue till June 10 or 15, but after June 1 they were scarce. The little fry hatched out are two inches long before the later fish have done spawning. Spawning beds extend up to Aylesford. Netting is overdone, and as the fish have decreased the netting has increased. From the county line to Paradise there are over 200 nets set, *i.e.*, in fourteen miles. Formerly the fishing was for home use but now it is for market, and a fish worth 5 cents formerly is now worth 25 cents. Shad are in great demand. I have had a lot of experience with stocking operations, and when carefully done grand results follow, but I planted salmon in streams and shallows, not as I was instructed in the lakes. No one who has an interest in fish will dump them in where the fish can't do well. I may say that planting wild rice is a success on the Nictaux, as done under Dr. Reid's plan.

I. K. Phinney said I have hatched trout for five years in Phinney's brook flowing out of Phinney's pond. Originally it was a beaver dam which formed the pond, but 90 years ago it was cleaned out and trees 2½ feet in diameter were found holding the water back, but 60 years ago a dam was built to run two sawmills. There were always trout above the dam. I got them when I was a boy, but chevies and suckers came up the brook. My father drew off the water, took out the stumps and for 20 years the place was a garden, then my father once more flooded it and stocked it with fish. I lost the fish for two years, as in summer they went down, and on drawing off the water found they had got away and the boys got far more trout than before in the river at Middleton, due to my pond. They were large (1 pound) and better fish. The trout not bred in the pond will go out and spawn in the stream, but a trout bred in the lake won't seek streams. I have counted a dozen big trout in the gravel shallows about to lay their eggs, but a freshet would cause them to go down into the brook again. The fry should be planted in the smallest runlets of water. Among the fish sent from Bedford were some salmon, I am sure, and they grew very fast. I drew the pond off and let these go down into the Annapolis river, when 4 or 5 inches long.

E. V. Thomas, Middleton, said that Elliott or Rock lake, on the top of Annerly or North mountain, had a small lake at a high elevation. No trout spawned in it as there was not a patch of sand in it. Some fish planted there were no doubt salmon. I struck several schools and they were very gamey fish, 1 or 2 pounds in weight. No fish were native to the lake unless a few small minnows.

James White, secretary of the People's Game and Fish Protective Association, Torbrook Mines Branch, Middleton, said that salmon had diminished because of the destruction of smelt and parr in Phail's river, four or five miles above, by boys fishing for trout. They take bait readily and actually in Middleton are caught by thousands. The boys don't know what they are, but the scales are smaller and the head smaller than trout. They jump when hooked like a salmon and are 8 or 10 inches in length, but the parr one year old are smaller. All should be put back.

H. V. Gates said that shad had very much decreased. I fished shad half a mile from the town, above the iron bridge, with gill net 4¾ or 4¾ of an inch mesh and

weighted down or anchored with stones. I got seven years ago 100 shad in a night; not 10 as now, and in the season I caught 900 to 1,000, but only 30 all this season. I say shut down for four or five years. Fishermen can't make it pay now. Lots of men did not pay for their gear out of their catch, it was so poor, and my gear only worth about $10. The female shad run up first, only an odd male being amongst the first fish which are very large, 5 to 8 pounds. The males come in 10 days later, being smaller in size and more mixed. The fish are so ripe that the spawn runs from them when we throw them into the bottom of the boat. There are no shad after the 20th of June. I tried to get a salmon later, but we are not allowed to fish a net really for salmon, and I would have got a shad had any been running. We catch 'come-backs' and they are very different in colour owing to being so long in fresh water, being white, flabby, soft and very sharp on the belly. They are very different from the thick heavy fish got earlier and of no market value. Both males and females are equally poor. They are sold chiefly in Halifax, but I have caught many and sold them to local dealers here. One dealer (Charlton) would have given 10 cents for them, hence men so anxious to catch them. The shad are caught going up and down, but most seem to be moving down when taken in the nets.

Nineteenth Sitting.

Court House, Truro, N.S., August 28, 1908.

The sitting having been formally opened by Professor Prince and Mr. S. F. Morrison, the taking of evidence was proceeded with.

S. D. Maclellan, K.C., said that there is very little fishing in the Salmon or the North river, but formerly large quantities of salmon even within the town limits of Truro. The water is still pure, there being very little pollution or sawdust. There is the dam at Union. Reports are current that salmon below the dam are found in quantity and it is also reported that poachers take great numbers of them. Poachers are the greatest exterminators and the fish are used locally. A few trout, both river and sea trout occur, but no great quantity. The fishing is so poor that no anglers would come a distance to fish, indeed I myself go to Newfoundland for salmon fishing. There is no reason why Salmon river should not equal Robinson's Brook, Newfoundland, where one angler, his wife, two sons and a daughter employed five guides and paid $500 for 21 days' services, thus giving those people their living for the whole year. In addition it costs such anglers a good deal to get there, yet they are willing to spend the money for a short angling holiday. Newfoundland gets a large number of tourists. I know of twenty anglers on ten miles of one stream. Some of the anglers came as far south as Philadelphia, and from Boston, and many from this very province, Nova Scotia. The officers came round every day to see that the fish were properly caught and poaching prevented. All things considered, the protected rivers are a great source of income for the whole country, I never see any wardens or fishery officers on our rivers here. There is some sawdust pollution at Riversdale. Respecting the shad they used to be very plentiful, and thousands of barrels were shipped each year from Great Village to Boston and New York. I myself remember pitch-forking five to twenty in the holes on the flats in a day. The local consumption was important both to the householder and the dealer. They were a very delicate fish and are much missed. Instead of whole schooner loads being shipped away not even barrels of shad can be got without difficulty. Roe shad have been destroyed. I have seen in this market (Truro) shad from the Stewiacke and Shubenacadie rivers which on examination were seen to

contain a large quantity of roe. When I used to see bay shad long ago we never saw roe in them, the bay shad being caught later, viz., in July. These large spawn shad did not differ so far as I could see from the bay shad excepting in size. I have heard of the success of the shad hatching on the Pacific but as this is the natural home of the shad I think any such steps should have even greater results here, I don't think that the commission has started any too soon. I should think that close seasons and propagation should be effective here in restoring the shad. Of course there is more or less sawdust in every river, and at Folly lake or in the river there is some of it on the bottom to-day.

Job Nelson said: I have fished shad formerly from Black Rock to Burn Coat Head. There were plenty of shad. With ten bunches of twine we got 400 to 500 on a tide. I often drifted up into the mouth of the Shubenacadie river but got few, not more than six or eight. When fishing for gaspereau I got at times a 'spent' shad earlier, of course, than the shad were got in the bay. These spawn fish are not fit to eat, and fishermen would not use them. No spawn shad were caught going up the bay in May as they appear to swim deeper by instinct. They entangle at times and are easily taken as they have not much life in them. No one made a business of taking those fish. Gaspereau were very plentiful too, but the spirit of greed was not as strong as now. Formerly plenty were in Green's creek and Short's lake, in the lake, but obstructions, especially a dam at the head of Green's creek, have done harm. As to small shad I have seen them 2 inches long in the channels of the beach in June or July, and in the weirs I have seen shad 6 inches long. I think I have seen the smaller ones also in the weirs. The large spawn shad are the mothers and are the same species as the bay shad which are the half-grown fish, 1 pound up to 5 pounds are the bay shad and they are taken in 4 or 5-inch mesh drift nets in the bay. The annual earnings of a shad fisherman would be $400. But now a catch of eight or ten shad on a tide won't pay. It certainly would not be a hardship to the fishermen to close them down. I know that 1,500 spawn shad have been sent to one dealer and put on the Halifax market at the present time. In Truro last spring 8,000 to 10,000 shad were handled. All these are from Shubenacadie and Stewiacke rivers and they were examined and seen to be full of spawn. Bay shad very seldom have any spawn in them. Formerly five or six salmon and 500 to 600 shad would be a catch, but salmon have increased owing to hatcheries and no less than 2,000 pounds have been taken in four weeks fishing. Bass fishing should be allowed in spring as they are destructive. Sawdust is harmful, covering the food as well as the spawn.

E. C. Crib said that quite a few fish go up Salmon river and North river. Last year I counted twenty-seven salmon at one time under the bridge ascending. As soon as the ice breaks up at the latter part of March or in April salmon are taken, anglers catch a quantity with red rag for bait. They are inferior compared with the salmon fresh in from the sea, but they are sold and eaten. They are soft, slimy, spent fish, very long and slinky. People call them grayling, and quite a number are caught every spring. If on their way back to the sea to recover in the sea they should not be caught. I wrote to Inspector Hockin and he said specimens had gone to Ottawa to be determined. They recover very soon after going down. In Belmont, Debert and Salmon rivers a quantity are taken every spring. The dam at Union obstructs lots of salmon and they are then taken illegally by the barrel all through the winter by local people. I have visited the dam; it is very high, and there is no fishway. People above at Kempton complain that no salmon get up since the dam has stopped them. It is 40 or 50 feet high, and is never used excepting for a few days' rafting. It has obstructed the river for at least ten years. The dam once broke and people all along the river dread that it may occur again and do great damage. Complaints have been common about sawdust, and more has gone in this year, more on Salmon river beach this year than ever before. It is much the same on North river as the small Lyons

mill is there and freshets carry sawdust into the river. There are places below the dam in salmon river where salmon could spawn but further up there are better. Trout occur above the dam half or three-quarters pounds weight, and at Park street bridge sea trout were seen this summer at the head waters.

G. W. STEWART said, that the spring fish which descend, come up in the fall to spawn and after spawning remain all winter in still places and come down in the spring. In Salmon river any boy can catch them with any kind of line or bait. The fish are poor and unfit for food. About ten years ago I went purposely to catch some of them, they were said to be grayling. I have seen day after day, boys catching them from early April to late in May. Coloured people take them largely. The spawning places are very poor now, whereas before the dam they ascended to better grounds. I found the stomach empty, they had not fed and the flesh was white.

E. E. MCNUTT said, that up to 25 or 30 years ago shad were plentiful. It was the taking of the spawning shad has surely but gradually decreased them, the decline began fifteen or twenty years since. They are so very scarce that it is hard to get a shad, whereas formerly there was any quantity. At Folly the other day nine boats got seven shad amongst them as their catch on one tide.

GEORGE LEEMAN stated as a dealer in fish he classed the fish taken in April and May as diseased meat, and he would not sell it. They look like a good salmon soaked in water, and are pale and white, the flesh having lost colour. They are spawned salmon. The shad is a fish always in demand, and I have shipped them to Halifax, Pictou, Antigonish and other places. I handle 1,000 to 2,000 or 3,000 shad in a season. I got them the 27th and 28th of June. I got some summer shad from the bay. We get spring shad also from St. John, fully two weeks ahead of the Masstown fish. These big shad 9 pounds weight are mother shad, and inside are of a bluish cast not nice white flesh and fat like the shad caught in the bay. I handled them last spring and previously a barrel now and then, while other dealers here handle three or four barrels from Stewiacke. Shortly after the gaspereau the last run of these shad come in. They are both sexes but the males are fewer. I distinguish them externally. I have weighed the spawn shad and found three pound in a nine pound shad, in others I found two or two and a half pounds and so on. The ova are well-developed like the smallest shot. In New York, the shad are three to five weeks ahead of here. Roe shad sell well, but they are like calving cattle, unhealthy. There should be a law prohibiting them. The bay shad are fat, plump and excellent. I think the shad fishery should be closed altogether for four or five years and they would return I am sure. The greatest evil has only been for a few years, it is only in the last ten or twelve years they have caught river shad: thirty-five years ago right in the town between Bible Hill bridge and Park street bridge, two men netted 39 or 49 shad in about ten minutes, a proof of their plentifulness.

WM. ALLEY said that 27 years ago he bought from a boy a salmon. I asked ten or fifteen citizens who saw it, 'Was it a spent salmon?' A United States expert authority who saw it declared that it was a grayling. That is the name by which these early descending fish are known here.

Principal CAMPBELL, TRURO, said that stricter supervision had restored St. Mary's river. Dams killed out the gaspereau and their removal has brought them back or led to their restoration to plentifulness. Netting is carried on completely across the river, preventing the ascent of the fish.

A. B. FLETCHER, TRURO, said that shad were very plentiful 50 years ago. The people speared them on the flats near Folly and Masstown. Then drift nets began to

be used. The depletion of the shad is serious for all the people. They complain that they don't get shad now.

Twentieth Sitting.

AMHERST, N.S., October 1, 1908.

After the commission sitting had been formally opened by Mr. S. F. Morrison and Mr. Simon Melanson, members of the commission, evidence was taken as follows:—

ROBERT LEESBY, AMHERST, said that I can remember shad fishing 60 years back. I have fished shad with set nets at the mouth of Amherst river. These nets were set on the flats on poles. The first nets used were 5 inches mesh, but this size was later reduced to 4½ to 4¼ inches. Each net was 12 fathoms long and 13 to 18 feet deep. These nets were picked every 24 hours. We began to catch shad about the 20th of June. We would take from 80 to 120 fish to a tide. Almost all the farmers from Amherst to Amherst Point were engaged in fishing shad at that time of the year. Each man had a net. These were fastened together into a string and run out into the bay. The shad caught were fat and of fair size. I hardly saw a spawn shad among them. We split these shad in the back, took off the head and left the backbone in. They were salted and shipped to the United States markets. About Amherst, shad fishing has been declining for about 40 years. I don't know why it declined. I don't think the sawdust has injured the shad fishing here. The fishery was an important industry and I think it would be a good thing to have it restored.

CHARLES COTES, WEST AMHERST, said: I have fished shad the same way as Mr. Lusby described in his evidence, but have not fished any for 25 years. The fishery practically stopped with set nets 25 years ago. No men here are drifting for shad but some are drifting further down the bay, on the New Brunswick shore about Wood Point. I heard that some fishing was done two years ago by Mr. Lake, of Windsor, and he caught about half a barrel at a tide. I have occasionally seen a spawn shad when fishing for gaspereau. I would like to see shad fishing restored, as there were fully sixty farmers, I think, fishing 40 years ago. They would catch from 10 to 25 barrels in a season with a 12 fathom net. The net was 60 meshes deep.

RALPH T. KEILLOR, AMHERST POINT, said: I have fished shad in the same way as the two previous witnesses (Mr. Leesby and Mr. Cotes). It did not pay us farmers to bother with the fishery, and I stopped 35 years ago. My opinion is that the destruction of spawn shad in the St. John river, New Brunswick, is the cause of the decline in our bay. It did not pay us to leave our hay and fish shad after about the first of August, and we used to stop about then. I have heard the old people relate a story long ago (I think over a hundred years ago) that there was a net put in on the Amherst creek, and it filled up with such a great catch of shad that it broke. The creek was full of shad. The shad is a valuable fish, and there should be something done to restore it. Shad have become so scarce that people here have dropped it altogether, they can't get them.

Twenty-first Sitting.

MINUDIE, N.S., October 2, 1908.

Commissioners S. F. Morrison and Simon Melanson opened the sitting, and the following evidence was taken.

DENNIS ARSENEAU, MILL CREEK, said: I am 83 years of age, and I can remember shad fishing 60 years ago. The first fishing I remember was done by brush weirs. Shad were more plentiful then, and the catches ran from 1,200 to 1,400 at a tide from the weirs. That would be about the latter part of August. I don't think these shad were as large then as they are now. Some of them might weigh 7 pounds. I have seen some spawn in them about the last of August, but very few in a catch. Afterwards shad were caught in set nets 4½ to 5-inch mesh, and later in 5½-inch mesh. Shad would arrive here about the last part of June. I don't know of any shad spawning grounds about this part of the country. I never heard of people catching spawn shad years ago. I split shad on the back, leaving the head on and the backbone. Then soaked them for 20 minutes. Cover every portion with salt. If I had shad now I could sell lots of shad at $10 per half barrel. I fished this year, but did not catch over 20 shad altogether. Sometimes I have got a salmon or two in the set nets. My net would cost about $70. I think that sawdust has been very hurtful to shad fishing, and if the mill owners were stopped from putting this in the rivers that drift down on the feeding grounds the fish would likely come back. I have seen some sawdust in the gills of shad; I have opened a shad's stomach and seen sawdust that turned the shad's stomach yellow. Dog-fish bothered me a lot this year. There are no drift nets on this side of the bay. If there was a close season made for shad-fishing it would not affect me much financially. I would like to see the shad fishery restored if I don't benefit myself by it, being a very old man.

LORANG BRIAN, MINUDIE, said I am a fisherman and don't farm much. I fished 50 years ago and then stopped and began nine years ago, and have fished every summer since. We had a good catch nine years ago, 10 half barrels to a 12-fathom net; they were then worth $4 per half barrel. Three years ago we had a good catch. We have shad nets now with 5½-inch mesh, but I think the mesh should be 5¼ inches. We get some salmon 4 to 12½ pounds each. I fished gaspereau this spring with a 3-inch meshed net, and I caught seven shad, six of them being spawn fish with the spawn pretty well matured in them. That was in May, and I caught them off the wharf here. I believe that shad used to go up these rivers to spawn. They are prevented from going now by dams, rubbish and sawdust in the rivers. This rubbish is very injurious to our nets. Sawdust injures shad, and this summer I opened 12 shad's stomachs and found sawdust in nine of them; it was new sawdust, and in some it was caked a little. I can sell lots of fresh shad now, and can get 22 to 23 cents for them on board at River Hebert. In half-barrels they are worth $12. I think a close season would help shad fishing, say close down from September 1 to June 20 the following year. Dogfish have been a great hurt to us. My fishing gear I value at $1,000; that would be nets, camp, &c.

Captain W. A. DOWNING, MINUDIE, said: I have fished shad with drift nets, also with set nets. I am not fishing now. The fishing here is carried on day and night. I stopped fishing before shad declined. I don't think that we have had a good catch of shad for 12 years. The three grand causes of the decline I believe to be the catching of the spawn fish, obstructions in rivers and the destruction of the feeding grounds by sawdust. I took this matter up with the Department of Marine and Fisheries 20 or 25 years ago. I tried to get the Inspector of Fisheries at Amherst (Mr. Rogers)

to take the question up. I could not convince him that a shad would swallow sawdust. He sent his son to the feeding ground, where the sawdust lay on the flats 7 inches deep. We opened eight or ten shad, and sent the stomachs that were filled with sawdust (I have brought a sample to show how the flats are covered with sawdust now), though the mill has been shut down for six weeks. My sample is taken off the flat where I have seen as high as 400 shad taken in one tide, with only 8 or 10 fathoms of net. There are no nets on this shore now. Where there used to be good fishing is now covered with sawdust. That is why the shad have left the feeding grounds. I agree with Mr. Brain as to the methods that should be used to preserve these fish; I think the mesh should be 5 inches.

GEORGE SYMES said: I fished shad for some years, but do not fish now. I am now farming. I have heard what the others said, and don't know of any other reason for the shad leaving the bay. I have seen lots of shad stomachs with sawdust in them.

FRED. SEAMAN said: That having heard all that had been said in evidence at the sitting he wished to say that he agreed with the information that had been given.

PHILIP BURKE said: I have fished shad, using set nets. I think that shad used to spawn up these rivers, but since dams have been put in them and rubbish, and sawdust allowed to go down the fish have left. I would like to see the shad brought back again, and think they would come back if given a chance.

FRED M. BURKE said: I am a fisherman and live at Mill Creek. I fish with set nets and have a little weir, made of brush in which I catch cod, haddock, eels and tom-cods. I never get salmon in the weir. I agree with Mr. Brain as to a close season. I have seen lots of sawdust inside shad. Fishing is about half my living. If we stopped fishing the track on the flats would get very soft. It is hard now because it is tramped every year.

PHILIP BRAIN said: I carry on fishing. Nine years ago I began, and the first season it was very good, but it has been growing worse ever since. This year is the poorest we have experienced, the catch is the worst. But if it was half as good next year as it is this year I would fish because the prices are so high that it pays better. I have opened lots of shad and found sawdust inside, and I agree with the others as to what might be done to restore the shad fishery, which was once so valuable here.

AMOS VERNON said: I don't fish, but I know that shad fishing was good here years ago, and it is rapidly declining. The present condition is a serious loss to the community. I would like to see it restored.

LORANG S. BURKE, MINUDIE, said: I have fished eight years and used set nets. The shad are not so plentiful as formerly. I think shad used to spawn up these rivers. I believe that sawdust has been a hurt to fish of every kind, and both to the feeding and the breeding grounds. We all would like to see the government do something to bring back the shad.

Twenty-second Sitting.

WOOD POINT, N.B., October 3, 1908.

Mr. S. F. Morrison and Mr. S. Melanson, commissioners, opened the sitting in the usual formal manner in Mr. Herbert Snowden's store, when the following evidence was taken:—

Captain NELSON PECKHAM, WOOD POINT, said: I fish and farm and I remember the shad fishery back forty years. At that time shad were very plentiful and a boat in ten hours fishing with 100 fathoms of net would bring in 500 to 800 shad. I fish with drift nets. Our nets were of linen Barbour's Scotch twine No. 16 and 18 knit on a 4½-inch gauge, 58 meshes deep. This twine was in bundles of 6 pounds each and cost $3.75 to $4 per bunch. This is hung on a float rope with lead on the bottom, 9 thread rope taken up half. This same twine now costs $5.25. We use now No. 22 twine knit on 4½ and 5-inch gauge and the nets are knit 60 meshes deep. The nets used now are much longer than when I began to fish. They run all the way from 250 to 600 or 700 fathoms. Our nets last only about two years. A fishing gear here will cost for boat $100 and $20 each for nets, and we will have about five nets which cost $100 more, that is in all about $200 for a fit out. I think a man, James Barnes, began to fish; that was about sixty years ago. We used to split our shad, taking the head off, in the back, leaving the backbone in with the tail on. We struck them first in puncheons and repacked them in half-barrels. They were sent to the States in schooners carrying stone. At that time they were worth here from $3 to 3.50 per half-barrel. Sixty to sixty-five fish would weigh 100 pounds for the half-barrel. There were about forty boats fishing along here in a distance of two miles at that time. I have seen some spawn shad. The spawn was poorly developed, and the fish were poor. I think not more than one or two in a hundred, very few of these fish appear about here. We go looking for shad here from June 12 to 15. I remember catching twelve shad on the first day of June. In these shad there was no spawn. For some years I did not carry on fishing as I was away from home, but I began again about sixteen years ago. Shad were not as plentiful then as they were when I stopped thirty years before, and they have been getting less ever since. This is the poorest year we have had. We get some salmon in our nets. They weigh from 3 pounds to 7 pounds and bring about 15 cents per pound. Shad sell here fresh at from 20 to 25 cents each. I fished from July 1 this year and am still fishing (October). I got eleven shad two weeks ago. I would catch about sixty half-barrels thirty or forty years ago. Forty years ago there were all of forty boats fishing from here within a distance of two miles. As to the cause of the decline of shad I think it is catching the spawning fish. Another thing that causes a loss about here—some people from the other side set nets in the strong tide. Shad strike those nets when going up on the flood tide and are washed out when the tides are running back. I have seen dead shad from these nets lying on the flats. I think nets should not be set in where the tide is strong. I don't think sawdust has injured us much about here. There is a small weir below us at Grande Anse, and it is made of poultry netting and catches all kinds of fish. Laurence Gillis is chief owner. My view is, stop catching spawn shad and protect the fishing by close season from September 20 to July 1, following.

GEORGE W. WOOD said: I agree with what Capt. Peckham has said excepting that I think the close season should be from October 15 until June 20 following. I caught on October 1, five shad this year, on September 30. I got sixteen shad and one salmon weighing 4¾ pounds. Three of the shad weighed 5½ pounds each. The size of the net is 4½ inches and 5 inches 60 meshes deep. 250 fathoms to a boat is the regulation. I think that the weir at Grande Anse should be taken out and catching spawn shad

in St. John river should be stopped. I do not think that shad fishing should be stopped here. Sawdust I think is bad for the fishing grounds.

Willard Barnes said: I fish and have heard Captain Peckham and I agree with him. We don't catch any spawn shad here, and killing them is an injury. There are eight boats fishing from here now in a distance of two miles. It would not pay to fit up a new net to fish.

James Ward said: I have fished shad but stopped fishing four years ago. I farm now. I think the sawdust is the cause of the loss of shad. They don't come here to feed now.

Emmerson J. Rodgers said: I fish now and have caught about 250 shad this season and sold them for 20 to 25 cents each. I also got five or six salmon this summer. There should be a fishery overseer here as there is no officer here. The loss of the shad is a serious thing to this community and we would like to see it restored. If the fishery were closed down altogether for a short period it would not affect me much. I think that dumping the offal out of the boats as some do should be stopped, as it brings in dog-fish and sharks which are injurious to the shad fishery. I split my shad in my boat dressing them in the salt water and bringing the offal ashore. There should be an officer to see that done in all cases.

Luther Snowden said: I fish and farm, and I agree with the others as to causes of the trouble and the remedy.

Rufus Cook said: I fish and do carpenter work and I agree with the other witnesses that the cause of the scarcity here is the catching of the spawn shad in the St. John river. I have heard of them catching them for the past twenty years. Indeed I heard my father talking about it when shad began to decline here.

Melbourne Burns said: I have fished until about seven years ago. It was a great industry formerly and I have packed seventy-four half barrels of shad in four days out of eight hauls. It would be a source of much profit to the people here if it were restored again.

Hugh Campbell said: I agree with what the others have stated about the shad fishing business matter.

Joseph Prescott, fishery officer, was present, but did not give evidence. He had driven over from Bay Verte, twenty miles, on purpose to attend the sitting and was prepared to aid the commission in any way.

Twenty-Third Sitting.

Pré d'en Haut, N.B., October 5, 1908.

Messrs. Morrison and Melanson having opened the sitting, evidence was taken:—

Dennis Richard said: I am 78 years of age and have fished for 66 years. I began when I was a small boy. We then used a net 150 fathoms long, the mesh being 4½ inches, then it came down to 4¼ inches, and it is now 4⅝ inches. We commenced with 47 meshes deep, but it is now 65 meshes. We fish altogether with drift nets and we

get some shad near the bottom rope. The length of nets we now fish is 250 fathoms, and we use No. 22 twine, linen. It costs $5.25 for a bunch of 6 pounds. The net costs $120 for a gang. The boat costs $125. There were 130 to 140 boats fishing out of this river in a distance of 10 miles 35 years ago. At our landing there were 37 boats. At the present time there is only one boat. To each boat there are two men. Sixty years ago we would take 80 barrels in the season or 1,500 shad per week. We sold them about the country for $8 per barrel. We split them in the back and left the head on. We think the fish are better cured in that way. About 35 years ago I think that the best catches were made. I knew the first man who caught a shad in the Petitcodiac river. His name was Dawson Steeves. He made a net 5 fathoms long and drifted about three miles on the river and got 5 shad going up, and drifting down he got 5 more. That was about 90 or 95 years ago. Mr. Steeves himself told me this and said it was the beginning of shad fishing in this river. About 25 years ago we noticed that shad were getting less, but have had some good catches since. About 11 years ago we had a good catch. I think it is 40 years since I knew they were catching shad in the St. John river. I think that they have been destroying the shad for themselves as well as for us. I believe that sawdust has hurt the feeding grounds, but we have never sent any petition to the government about it. The regulation about five days in a week is all right. About the 25th of June we used to go out to look for shad. There was a shad caught about the middle of May this year that was full of spawn. Such spawn fish were not as nice as our summer shad, but were about the same as the St. John shad. I never heard that shad went up our river to spawn until this spring, when I heard of some being caught near Salisbury. I think the shad caught in the rivers in the fresh water is the same breed of shad as we get in our river and bay. The shad we get in September I think have spawned and have fattened up on the flats here. We do not put the shad offal or guts in the water but bring them ashore for manure. We have not so many dog-fish as there used to be. About 22 boats are fishing out of this river now. It has not paid us to fish this year, and we would not fit up now if we had to start with new gear. We would like to see the shad brought back if it could be done. I think that if the St. John people did not catch shad until after the 25th of June we would soon have plenty of shad. I would say from the 25th of June to the 15th September was the right time to fish about here. As to salmon, there were not more than 30 salmon on an average taken to a boat this year.

Ambrose Melanson said: I have fished shad 64 years. I have caught 1,400 shad in three-quarters of an hour at Salmon river. There were 10 boats of us and we caught 14,000 fish. This was 22 years ago. Too many shad are, in my opinion, caught before they spawn. I don't think any shad should be caught before the 1st of July and then to the 15th September. In one year (1873) I have caught 9,975 shad. Fifty-six years ago there were only four or five boats fishing shad about St. John harbour. I heard that some shad were taken in a weir at Grande Anse this spring that were full of spawn. That was in May.

Simeon Melanson said: I have fished shad for some years. This year I caught 850 shad that averaged me 25 cents each. I also caught 100 salmon for which I got 30 cents each. These weighed from 3½ pounds to 5 pounds. One salmon weighed 14 pounds. I was fishing two weeks ago and I got a few salmon which were quite mature for spawning. I would very much like to see the shad restored.

PRÈ D'EN HAUT SITTING.

List of Fishermen.

Desite Gautro, Philip Offray, Samuel Gautro, Thomas Offray, Thomas Gautro, Maxime Offray, Arcade Gautro, Raphael Comeau, Patrick LeBlanc, Joseph Gautro, John Gautro,

Dominic Belliveau, Thede Richard, Samuel, Richard, Archie Offray, Philip Gotro, Vital Richard, Jude Belliveau, Raphael Gotro, Dominic Offray, Simon Gotro, Melas Richard, Philip Belliveau, Dosithé Melanson.

The above fishermen the commission was informed were in agreement with the views of the witnesses who gave the foregoing evidence at the sitting at Pré d'en Haut.

Twenty-fourth Sitting.

MONCTON, N.B., October 6, 1908.

When Professor Prince opened the commission there were present besides Commissioners S. F. Morrison and Melanson, Inspector R. A. Chapman, Mr. C. P. Harris, Mr. P. H. Fryers and others.

The first witness was Mr. P. H. Fryers, fish and meat merchant, Moncton, who said: I buy shad from the fishermen, chiefly St. John men, very few from men in this locality. I have bought them for fourteen years. The local supply has seriously declined and is not half what it was ten years ago. About August 1 for the last fourteen years we have got 40 to 50 barrels of fresh shad till last year when we could get none. Shad appear here in the Petitcodiac from May 1 to June 25. If the catching of them full of spawn continues shad will be a thing of the past. I buy them already cleaned, at least 90 per cent of the shad were cleaned. The shad taken here are mainly spawned I think in the St. John river. In that river they take them full of spawn, it is a sin and a shame. We get fat shad equal to any about the latter part of June. They are from 2½ to 5 pounds dressed. Then from that time to the end of July or first of September we get a few. They are good shad, but small, 1½ to 2 pounds weight and males. The September shad average 2½ pounds from down Hopewell Point, Shepody bay where the best catch was this year according to my purchases, but the total catch not better probably. Five years ago (1903) was good. The demand for shad is good and we can sell them locally for 25 cents each, but fourteen years ago 15 cents was a big price. I bought them for 8 cents. Large shad are taken in the Miramichi at the end of June and in July, but they are full of spawn and are poor and dry. The spawn in these mother shad was coarser and more dull than in St. John river shad. Externally they were a coarse grained looking fish. I don't handle salt shad, it is not worth while but the price is $10 per half-barrel. One local man had five or six barrels this season, they would be Shepody bay shad.

Mr. C. P. HARRIS (Messrs. J. and C. Harris) said. From 1857 to 1882 we did business in shad, shipping to Fredericton, St. John, Summerside, P.E.I., and to the United States. Forty or fifty years ago (1857 to 1877) we annually shipped 2,000 to 3,000 barrels away. We bought at $3 or $3.50 per half-barrel, or $4 per 100, *i.e.*, 4c. each. There were over 40 boats drifting for shad twice a week. They took 20 to 30 half-barrels a week. We supplied 100 boats at the mouth of the river, and furnished twine but they made the nets. It was shad twine imported from England, No. 20 or 22, nice white twine. It was all drifting in the Shepody bay from Belliveau's village to Cape Roget up as far as Stony creek. A few Petitcodiac shad still come here but not many. They were put up in hogsheads all salted in bulk. Sussex men would come to buy them by the 100. All were taken in Shepody bay and drifting was carried on up to the bend. A few nice little salmon were generally taken about five pounds weight. Each boat might have four or five salmon to 500 shad. On going into the refinery

operations after building the refinery, I gave up the shad business. We sold shad to St. John men by 1,000's of barrels, but we also sold to farmers by the piece, and to St. John by the hogshead. Now for a half barrel as much as $10 or $11 is the price. I gave $12 for a half barrel for my own use recently. Formerly sixty shad filled a half barrel but now forty will do it, hence the fish are larger now. The first run were big shad. The summer shad were 1½ pounds or two pounds dressed. In curing we used to take the head off, but now the head, backbone and tail are left on. Formerly the shad were split, the backbone and tail left in, but the head taken off and then were struck down. When the back bone was taken out it was a 'mess shad.'

J. D. HENDERSON, fish merchant, said: I have handled shad for 35 years. We could get long ago all the shad we wanted at 3½ to 4 cents each, but there has been an awful dropping off, a decrease of 75 per cent. The wharfs here at Moncton were lined with boats loaded down with shad and they were sold for $3½ per 100. I handled the heft of the shad this summer and I paid 25 cents each for them. They were mostly from down the bay and the price was $30 per 100. Most of them were split before I got them but our shad have no spawn in them. Our shad are so much fatter and of finer flavour but do not keep so well as the St. John river shad. I think that fresh water affects them. Apart from the fact that St. John shad are spawners they have not the same flavour as our shad. At the head of this river some shad have always spawned. The young fish have been seen. I met a man who got small shad at Boudreau quarries at the middle of September this summer on the Petitcodiac and they were the size of smelts four or five inches long. Thirty-five years ago we got no St. John river shad because they were not caught then I believe. This river fishing is a recent thing begun in recent years. A shad about to spawn is not so good as our shad and as a business proposition are inferior. I notice that the female shad has a deeper body and blunt shorter head, but the male is longer bodied. My opinion is that there should be a close season until July 1 each year and protect the spawn shad.

Mr. R. A. CHAPMAN, Inspector of Fisheries for New Brunswick District No. 2, under the Dominion government, said: I lived in Belliveau's village from 1849 to 1855, and my father and brother dealt in shad largely. Shad were very plentiful, and 35 boats fished out of Belliveau's village alone and in the Petitcodiac river over 100 or a total of 130 or 140. To-day there are not more than 21 or 22. The average catch was 400 or 500 on a tide to each boat and the price was $4 per 100 wholesale. The men tried in May but the fish began to run about June 15 at least the catches began then. Practically no spawn shad were taken not more than one in 500 shad. Such spawn shad were I believe on their way up the river to spawn. The average size was not over two pounds dressed. The second run was about July 15 to the middle of August the fish being not extra fat and were 1½ or 1½ pounds dressed, or 140 to the barrel. They probably came in from deep water. By the latter part of August or in September the fish were fat and feeding all summer on the flats, and the cooler weather made them superior fish. They were very thick, plump, fat fish, more than two or two and a half pounds on the average, or forty to a half-barrel. Thirty-five picked shad made a half-barrel. They were blue on the back and often called blue backs. Their food was a shad worm on the flats. They devoured small worms, these formed part of their food. I noticed the depletion of the shad for thirty years. Forty years ago the fishery was at its best. I have repeatedly reported to the department at Ottawa and my main contention was to preserve the shad while spawning. In my official district I have not only the shad of Shepody bay but the North shore as a few shad are in the Pokemouche and Tracadie rivers and many in the Miramichi, also the Richibucto, but not the Buctouche or the Cocagne. A close season to June 20 or better still to July 1, would help to save the shad. Fishing after August 15 would involve taking of salmon but they must be liberated alive. The bulk of the salmon go up before September 1. They ascend the Miramichi all summer but the fall run is quite

different from the earlier runs and should not be used for hatchery purposes. The regular fishermen caught parent salmon for the Dominion government's hatchery on the Miramichi and took far more than they sold to the hatchery, but as they were under special conditions nothing could be done and the surplus salmon were salted. The salted fish ran about ten pounds and are better in quality than the famous Restigouche fish. The latter run twenty pounds and over, while the Nepiquisset salmon are about ten pounds on the average. The Bay of Fundy salmon are five pounds weight as a rule.

Twenty-fifth Sitting.

SALISBURY, N.B., October 7, 1908.

Professor Prince, chairman of the commission, opened the sitting, and the following evidence was taken:—

JAMES A. STEEVES, COVERDALE, ALBERT CO., said: I am fishery officer and have under my charge the Petitcodiac river and tributaries, 25 or 30 miles of the river. I do not go below the head of tide as they drift with nets below and take shad and salmon. The idea is to protect the spawning fish above the head of tide. I never knew shad to come here until two or three years ago. It is not more than three or four years ago that I heard of them in numbers coming up with the tide. They are caught in greatest numbers four or five miles above Salisbury, near Collier's bridge, where there is a reach of river about a mile of clean gravel bottom and no mud. Intervale river it is called. I do not begin duty till the salmon run, as I have no instructions to attend to the shad. The spear was the first way of taking shad. It is unlawful and I don't allow it. I cannot do anything if I find a man netting shad, but the men are afraid that some action can be taken against them. Several barrels of shad were shipped from this part of the river lately, this last spring. The shad may have been coming up this last fifty years but no one knew. I talked to Mr. Taylor who is across the river, and he thinks they come here every spring, in early May and June. The smelts come up for a week or ten days about May 1, or the last of April, to spawn, If the shad have come up, as it seems they have done, they must spawn. About Hillsboro' the river was full of schooners shad fishing. I have been told by Mr. Jones, a farmer living four miles above here, that he noticed schools of small fish with very bright scales, small shad he believed them to be. They were three or four inches long and had a deep body. There were lots of them. Possibly in the fall they are along the river shore. I have been told that eight or ten miles above here great quantities of gaspereau were got in spring. No one now pays attention to them though they may still come up. Salmon appear the last part of June and during July, depending on the tides. The water is muddy, but after the tide goes down it is clear but brackish, and the fish ascend to fresh water. There is no netting after August 15, but fishing with fly is allowed. The spear is forbidden for salmon. Mr. Jones has one of the best salmon pools and a St. John angler 'Kiltie.' Jones tried to get some salmon but did not succeed; perhaps he had not the right tackle. The fish are most numerous when we have big tides. They continue till September and October. They average 5 or 6 pounds, ranging from 3 to 12 or 15 pounds, though rarely over 12 pounds. I have noticed 'black' salmon usually large fish. On the river (the Pollet) I saw in the fall red-colodred, hook-nosed salmon 12 pounds weight perhaps. The Pollet is the chief spawning river for salmon, as the main river is dark water from flat swampy country. Fry have been planted eight or ten miles up and

the resulting fish have been caught, a different kind of salmon, it is claimed. There are mills on the iver. White's mill, Pollet river, has a furnace and a little sawdust gets into the water, but a lot of forest refuse is in the river. There is a dam across up which no salmon can go, and no fishway, but Inspector Chapman thought that there was sufficient spawning ground below for thirteen or fourteen miles below the dam. Above the dam it is hilly country, not settled, extending up through Elgin. There are fine trout in Lake Elgin. A little mill cutting 3,000 or 4,000 feet is up above. Humphry did let sawdust in but he now handles it, having spent $3,000 on it, and he feeds his engine with the sawdust. A big mill at Petitcodiac has a dam 8 feet high blocking the main river: five miles above here is a grist mill and disused sawmill, and a fishway could be easily put in the dam. The inspector thought that salmon could get over it.

J. Nelson Smith, Lower Coverdale, Albert Co., said that 40 years ago shad were plentiful. They were caught in drift nets and were sold very cheaply, viz., $1 per half-barrel and the very best at $5, all sizes were caught. They began to dwindle 20 to 25 years ago. They got scarce gradually, and men gave up fishing as it did not pay. In my locality only two shad boats now, compared with a dozen long ago. There were 37 boats at Belliveau's village alone, now not more than 22 boats altogether. If shad were still plentiful we would know it. I often caught shad with a scoop net on the flats, the water was full of them. At times a salmon would be got but no one looks for them now. There were always a few averaging 5 to 8 pounds. The September shad were fine and fat, but I never saw spawn in one when dressing shad. It would be a great benefit if shad were brought back, everybody would benefit. I don't think that the men here catch shad or salmon before they spawn, but the St. John fish are full of spawn.

G. Jones, Farmer, Petitcodiac River, said, I was born here and can speak from 58 years experience and knowledge. Shad come up this river for four weeks, but the smelt only one week. I have seen shad very thick within a few years. They are thicker now than formerly and are caught and sold. Many are speared. Two and a half barrels were sold fresh at one time at 25 to 30 cents each this season. I know the men who caught them. The St. John river was the main source of the Bay of Fundy shad and this river was insignificant in quantity. At the last of June and in July, I have seen young shad 1½ inches long close inshore. They moved like a thick band close in to get away from the trout and eels. I caught some with my hand. They were deep chunky fish and very silvery, two or two and a half inches long, and quite unlike suckers which are round. They go down in September. There is a fine salmon pool just here. The salmon buries its spawn. The fly is no success here with salmon. I have taken many parties out but no man ever got a salmon. Sheriff Botsford and Duncan King spent three days trying all kinds of flies 25 years ago, but had no success. Men have tried since but without success. They say it is in the breed. A new gamey kind of salmon should be planted here. I believe that shad ought to be protected. If not harrassed and caught out they would be here in great numbers. We have known that shad came, but they never took our attention like the salmon. Gaspereau are here about the same time as the smelt, about May 1. They are not so thick as when I was a boy, forty-five years ago, in the main river. Shad and gaspereau always take the black water and were so thick we just dipped them out with our hands. In Jones' brook close by the farm the water was solid with them. A few still come. Eels are plentiful of large size. Lamper eels spawn here and die every year. The river is offensive with the decayed bodies some three and four feet long. They don't go I think up to headwaters but die in quantities around here. I have seen big shad many five and six pounds, but seven and eight pounds fish and I have seen even nine pound shad. All are large fish. My man got many here in the spring of 1907, out of 28 shad he got half a dozen were very large. It is a shame to take nets

and scoop them up. Very few are taken by spear, they are so quick in movement. Twenty years ago an officer taking some salmon fry north stopped and put them in a brook below the village. I got some of the fish when grown. I saw the difference, they were a bigger salmon. He put them in here to save them, they were weak and dying. We get seventeen and eighteen pound fish, but they are exceptional, the general run being nine and ten pounds. I notice the he-fish with a hook-bill, coarser, bigger and slimmer than the she-fish. They stay all the winter and go down in April, black in colour and poor. They are black like the water, and unfit to eat, yet men will catch and eat them. In June, the boy here got a salmon and got 25 cents for it. Others sell for 50 cents and 75 cents.

A. E. Killam, Moncton said, 40 years ago near Sandy Race, below the old mill salmon were got. I knew of twenty-four salmon got, one weighing 23 pounds. They were all speared in a hole 10 feet deep and 25 feet across. It was a kind of a pot washed out by the freshets.

Officer J. A. Steeves added to his evidence the statement that in Petitcodiac River, in the vicinity of Turtle Creek, four or five miles from the main river below the dam there were numbers of little salmon not more than six or seven inches long.

Twenty-sixth Sitting.

Riverside, N. B., October 7, 1908.

At the sitting for taking evidence at Riverside, Professor Prince, Mr. S. F. Morrison and Mr. Simon Melanson, commissioners, were present. The evidence given was as follows:—

Peter Carnworth said that great quantities of shad were taken at one time at Alma and Waterside in weirs. Cod and salmon were taken when the weirs were set early in the season in May. Shad were taken this year, 1908, in July and August, and sold for 45 cents each to Mr. Robinson. There is a lake seven or eight miles up the river here, viz., German lake, the water backs up there from the sea. Hence muddy water goes into it at times. Whitefish were planted in it but they never amounted to anything so far as can be seen. Sea trout ascend there. Salmon went went up the lake and up the streams emptying into the lake, but shad never went there to spawn. Shad were formerly caught here and cod; but the cod were not taken care of, they were carted on to the land when I was a boy, 30 or 40 years ago. Only one man fishes a weir at Alma for salmon. In 1907 there was a big catch of salmon, but this year the catch was poor down at the cape. A man with a boat here tried for shad, &c., but he got a few sea trout and gaspereau but no shad.

W. Fletcher said that 37 years ago he remembered that plenty of shad were taken then. We could buy shad whenever we wanted them up to September. They were of all sizes, none were very large and most were salted. There was one weir and the following arrangement was carried out:—There were 100 owners and everybody had a tide or two tides. I had one man with me and we all went out and built the weir, or rather 25 or 30 men built it, but we all joined in a contract. Some of the partners lived four or five miles away. The fish were hauled to Goshen, Elgin and traded there for buckwheat. The price was $8 a barrel or 4 to 5 cents each. There were really only 14 shares and each share had two tides, but it was divided and subdivided. I never saw spawn in the shad here in the weirs because the weirs were never put in

till the spawning was done, but I always noticed the spawn in the St. John river shad brought here in vessels in March and April. The spawn was the biggest part of the fish. The shad were not so good as ours, indeed they are not so good anywhere when they have spawn in them as they are without spawn. The cause of the present scarcity is the catching of them before spawning, the winter fishing. Formerly 100 barrels were taken at a tide, but it is all over these days. There is not one living excepting Jim Dixon, who lives three miles down the shore, who had a share in a shad weir, he is 68 years of age. The weirs were put in about the first of June, that was the time the first shad were taken. There were No. 1's and No. 2's, and No. 3's were called 'round' shad. The weirs were built of brush and stone and they took two weeks building. No trout were taken in the weirs. Salmon were caught, sometimes 100 or 200 at a tide, and large cod once in a while, also skate, lobsters, &c.

Leonard Martin said that the local fisheries were much changed. All made good catches formerly when there were six weirs in five miles of shore here. I have known the fisheries for 30 years, and fish were plentiful. The fishing was by brush weirs and a few fishing boats. Out of one weir, not more than 4 feet high, I have known 100 barrels of fish taken on one side. I have a seine 8 feet high and I don't take two barrels. There has been a gradual decrease every year in salmon and shad. Men came and drifted down from Hopewell cape and Westmoreland to Martin Head and made good catches. Eight years ago Buckland, of Alma, tried the drifting and got a few fish, but it did not pay. He tried one season only. The depletion is due to sawdust. The gills of fish in weirs are full of sawdust. I'd stop the sawdust first and mill refuse. My weir has often 2 feet of sawdust in it, not floating but water-logged, hardwood sinks quicker than spruce. Lobster traps are two-thirds full of sawdust. It floats out all the time from April to September. The flats are covered with it though the mills closed for over a month. There are windrows of it 2 and 3 feet high and driftwood. The shad worms or food are buried under it. In every 1,000 logs the sawdust is 1 or 1½ inches. The mill on Upper Salmon river should put in a proper sawdust burner, it is a good place for one. The present burner is no good as the wind carries half of it away into the river. It might be placed at one side, opposite side of the bank and would not cost much. I'd like to see the shad come back. Our spring shad were 7 to 7½ pounds in weight and less, and were not poor but fair conditioned shad; the July shad are large and a little better than the June fish. There were two runs of shad, fall and spring, but the fall were fat and in good condition, and about five pounds weight our fish used to run one hundred to a barrel, but my total catch this season did not amount to that, I did not get enough to supply the village. I have seen St. John river shad but not opened, but I heard that they are poor. I never saw spawn in any, but never opened any. The salmon have decreased. The brooks were formerly full of them going up to spawn. At one sweep of a net 20 or 30 would be got. Now there are very few. This summer about 100 taken, the largest I got weighed 18 pounds. The average is 8 pounds down to 4 pounds, but very small ones are few. They are firm solid fish and sell here at 14 cents a pound. On Martin's Head river there has been no sawmill for 12 or 15 years and the river is full of salmon, lots have been got. Years ago we would get 200 or 300 on one tide, but the sawdust has kept them out. This is proved by the river just mentioned with no sawdust and it is full of salmon. There is a fine salmon pool with plenty of salmon in it just below the dam.

Twenty-seventh Sitting.

HAMPTON VILLAGE, N.B., October 9, 1908.

Professor Prince and Commissioners Morrison and Melanson having opened the proceedings, evidence was taken as follows:—

FRED. D. PRINCE, farmer and fisherman, Lower Norton, said: I fish through the ice in winter and fish in summer and send my fish to Boston. In spring I fish shad as they go up above Norton and spawn up there. From the 24th of May to 10th of June is the best fishing and about June 18 the shad fishing ends, a stray one after that only. All are full of roe. The male is smaller than the female, which are not only the biggest but are very fat. The first shad are very fat (about June 1) but they fall off as the weather becomes warmer. The general weight is 4 pounds but some run as high as 8 pounds and they are sold locally. Mr. Barnes takes them from me, and I have sold to Mr. Doyle during the last two years; he is at the north end of St. John. Every farmer on the river has a net but I catch the most, about 1,000 shad every year. The fishery is failing. I first fished shad 12 years ago. As far back as I remember my father had a net and set it anywhere we liked and the river was full of fish. Four miles below here the water rises and falls 18 inches, but at very low tide it gets brackish at my place. Five miles below it widens out. There is a big tide here in spring. The farmers just fish for their own use and no big catches are made. We don't set our nets square across, don't want to, but we let the net go down as the tide ebbs and as it turns we get fish and take out the nets as the tide runs up. Shad soon die. The fish stay only a few days. A few shad go up above Percy Point and then go away above Norton. I see small shad in Darling's lake in October; millions are there now 2 or 3 inches long. They swim on the top of the water and look exactly like little shad or gaspereau. They may be schools of young that have lost their way but most have gone down. There are more in spring, the water being full of them. The other day (Monday) was a still day and we saw a school 10 feet wide so thick that we could catch them easily with our hands from the gasolene launch. It was quite a surprise to me. The pike we call chain pickerel were feeding on them. Other fish we take are eels (in traps), yellow and white perch, pickerel and salmon. Further up the river is narrow and salmon are taken readily, whereas we can't get them. I did not get a thousand shad this year and the total catch in the Kennebecasis would be 10,000 ; up above big catches were made this year clear to Norton, a total of forty people probably fishing. Mr. Drew fished only a short time and only got 200 shad, but down at the harbour a great many more than we get are taken. Not much can be done in the wide river below, possibly not more than 500 shad taken between here and St. John. The nets we use are cotton gaspereau cotton net cut into two and making eight lengths 18 meshes deep. The net is thus 18 fathoms or 60 yards long of 3½-inch mesh. Shad nets are 4½ inches, 40 meshes or 12 feet deep and 75 yards long with a float rope along the top and sinkers along the bottom. In spring when we use these nets the water is high. The shad go up quickly so that one day we see them five miles below and next day they are up at Norton. Late one year when there was high water after rain I saw many shad running round each other, no doubt engaged in spawning. Shad are quick in going back after spawning. Lamper eels are caught sticking to shad—large ones. Common eels are enemies to shad and they attack a shad in the net in a moment. They are an injury to us. Eels bring 8 cents a pound, pickerel and perch, &c., 10 cents per pound. Perch are often large, the biggest being 5 pounds weight. Shad sell for 15 cents during the last two years, but Barnes only gave 10 cents, but I heard that 40 cents was

really the value. Respecting salmon, I never bothered with them and never got more than one or two salmon in my nets in my life, but many men catch them and some are taking them now (October 9). Eels are a curse and the lakes near here leased by angling clubs are full of eels. I have seen a barrel of eels round one shad. Smelt come up but only a few here, most are taken lower down. Sturgeon also occur below; 14 or 15 years ago some United States men got them in the river, some weighing 300 pounds. They cleaned them out and we get only the little ones in shad nets. Black and striped bass occur, the former being, say 4 pounds, and the latter 30 or 36 pounds in weight and mostly in spring. We see striped bass dead in spring when the water is high; they drift on shore, some of them just dying or dead. The 'come-back' shad are poor and look bloody owing to the influence of the water, as after a week or so in fresh water they get very soft. Some of these poor shad are salted and some are sold fresh. A very few gizzard shad are got and they are not as bony as shad and they are indeed a nice fish with a gizzard full of gravel like that of a fowl. The scales are fine, not like those of a bass and they sell as whitefish at 6 cents a pound. In this locality there is no fishery officer and no statistics of the catches are available.

R. E. Fowler, French Village, King's County, said: I used to fish a lot, but now I fish trout for sport occasionally. I fished for shad in Hammond river which runs into Kennebecasis river, six miles below Hampton. Eighteen or twenty years ago I fished for shad and they were quite plenty, far more so than now I think. We sold a few and salted the rest and sold any surplus not needed for our own use. The most nets we had was two. No drifting was done, we fished on the slack. If we'd drifted we'd have required a new net every night owing to logs and branches and the shallow streams. We bought ready made nets 4⅝ inches mesh I think. Hardly any one fishes there now. The witness, Prince, and his brothers are the only ones, but formerly every one had a net. We had a fishery warden or officer then, Hines or Hiney of Norton, an oldish man, but there is not one now. Martin Hopper was officer for one year, he was about forty. The law about one-third width of a stream was enforced. Three years ago shad were taken in one night with thirty fathoms of web taking up one-third of it to thin it. Three or four nights fishing now would only give that catch. The net was run down stream the top of the net being along stream not across or it would have been seized. We took out the net as soon as it turned. In the lake we could fish until daylight, but we'd look at the catch every hour or the eels would devour any shad gilled, at once. Gizzard shad are eaten at once by eels as soon as they strike the net as they are so soft. Pickerel are destructive on smaller fish. In spring there is some still fishing. A good many salmon go up Hammond river to spawn, 15 or 20 pounds weight. I have seen them lying under the bridge. I saw three big ones and some boys got them that very night. Portable mills put lots of sawdust in Hammond river during the last year or two. The brooks are just sawdust carriers. This spring numbers of small salmon four or five inches long were seen. One night this summer we saw two or three dozen salmon six or seven inches long. I have seen salmon dig holes for their spawn. There is no doubt that shad spawn up this river. Shad must spawn in the main river as I saw shad not more than three inches long in Hammond river. The cause of the decrease may be low water for two springs. They don't come up as quickly when the water is low and they are taken in greater quantities in the harbour at St. John. High water enables them to come through the reversible falls. Fish move against the tide whichever way it is running and when the ebb slacks we get the fish. The witness, Fred. Prince, is now the only local man making a business of fishing as Applebys on the island are now out of fishing. Prince has three brothers who have fished but most of them are away. Flewellings use sawdust to heat the dry houses, but portable mills use slabs and dump the sawdust into brooks. Titus's dam blocks the Hammond river eighteen or twenty miles from its mouth, but a lower dam is now cut through or washed out and will be burnt. Hook and line fishing for trout and salmon are carried on as high up as that, but only one or two salmon a year are

taken. Dr. Dale and Mr. Gould, florist, at Sussex are great anglers and interested in preservation. Here at Hampton the water is always fresh for the mills. The water is lower than formerly, it used to be high in May, but now at that time the water is off the banks leaving them dry.

Twenty-eighth Sitting.

BOARD OF TRADE ROOMS,
ST. JOHN, N.B., October 10, 1908.

After the sitting of the commission had been opened by some explanatory observations by Professor Prince Commissioners Morrison and Melanson, evidence was then proceeded with.

ANDREW HARNED, CARLETON, said: I have known the shad industry for thirty years in St. John harbour. The fishing carried on was shad and gaspereau drift net fishing, weir fishing and other fishing. I know fully the herring fishing of the Bay of Fundy. The fish taken in these fisheries are shad, gaspereau, herring, salmon, striped bass (a few) and sturgeon. Once in a while we get a moss-bonker or menhaden, some years they were more numerous. The shad nets are 45 to 65 fathoms long in the harbour, but outside they are, I am told, 300 to 500 fathoms. I fish a net 90 meshes deep, 4½ or 5 inches mesh, *i.e.*, one gang, all one man fishes. Our net is taut and takes up one-third. Gaspereau nets are 42 or 48 fathoms long, 160 to 170 meshes deep, four gangs may be fished, but I fish two gangs, the mesh being 2⅞ to 3 inches, some men using 3⅛ inches. The mesh varies with the time of the year to some extent at the first of the season the water is cold and the fish deadish and easily meshed, but with warmer weather the fish get smarter and are smaller in size and we use smaller meshes. The weirs get the fish when a freshet comes sending them towards the shore. The mesh in the weir is 2¼ or 2⅜ inches, some have 2½ and some 2⅝ inches in dead water as the fish don't force themselves through a big mesh. Only in some cases is a wood bottom or floor used; but on the shore or flats the weirs have wood floors. As to the time of fishing the gaspereau usually are fished from April 10 or 16 until June 20 or 25 and occasionally up to the limit. I began April 16 as it begins to pay to fish then, but not before unless exceptionally; thus if the season be open the fishing is good earlier. Occasionally quite a few shad are taken in gaspereau nets, this year at least half a barrel in my net and 1½ barrels in my weir. They are large fish and tangle in the mesh. The biggest shad we get in the gaspereau nets, and occasionally a salmon. Quite a school of salmon came in early this year and meshed easily, being somewhat lifeless. The shad were rather later this year, viz.: from May 12 to 16, and the height of the fishing was May 24. It used to be a little earlier and finished at the end of May. The harbour shad fishing winds up about June 10, and in the river ten or twelve days later. We get a number of salmon because the net is slacker and tougher and the salmon are swift and more easily meshed. Salmon run from 16 to 20 pounds in weight in the gaspereau nets. The early salmon are the smaller fish and a 6-pound salmon goes through a shad net. The weirs are put up on the flats and the island from March 1 or 15 to April 1, but on the shore it is later as they are built from April 10 to 15. When the ice makes late the weirs are late in building. We call weirs below the falls tide weirs. If the ice is early the weirs are early. They are fished until August 15. All kinds of fish are taken, and shad as small as gaspereau are taken in all the weirs, the fiddler salmon or grisle 3 to 7 pounds in weight. They are rarely taken 2½ pounds and shore fishermen call a salmon a 'bone.' When the net

bunches up we get gaspereau especially outside the harbour. Gaspereau descend and go out as early as the middle of May, but not many that early, quite a few in June from 15th to the 20th and later to the 23rd, but the bulk, about two-thirds don't go out till winter, being very very thin and poor and spongy and just soft 'slabs.' Our nets for gaspereau are flax and cost $21 to $24 each, or $30 rigged out. To make it pay we must fish three to five nets. Hence we expend $150 for nets, the boat is $50 or a total of $200 and we must have stores and wharfs in order to put up the fish. I took a trip this summer and met a farmer who fished and he told me that his outlay was trifling, the nets being cotton and outlast three of ours, the length being 100 yards 50 meshes deep and the total cost being $10 to $20, the boat being a very cheap one. Our nets are flax and 150 yards long and 170 meshes deep and of flax. The farmer said that in his three weeks fishing he got 200 to 300 barrels with the short nets used above Fresh lake, off Grand lake. The fish were so thick that in one night he took ten hogsheads, or forty barrels. It must have been right on the spawning grounds. Owing to the freshets he had a good year but ours was an 'off' year. If there is a freshet the fish get past our nets. A quantity of Grand lake fish come to St. John dealers. We pay high for our weirs as they are put at auction and we lose money if fishing is poor. The city auctions the locations, because formerly it belonged to the citizens, and was given to the city, and a stranger can buy the fishing rights. The first Tuesday in January the sale takes place after advertisement. The lessee has no claim to a renewal. The prices of locations have risen during the last six or seven years, because the price of fish has improved, so much fresh bait is in demand for cod, haddock and halibut, especially during the last two or three years. The demand has lessened for salt bait which have put up. Fishery lots may cost as high as $1,400, add to this $100 to $600 for parts of the outfit requiring renewal, and it is costly. We require weir net, poles and flooring and labour, but not boats. As a rule, two men are interested in a weir. One hundred feet length is a shore lot from high to low water mark; it is a water front. No weir can be erected in front of a lot, and a lateral distance of 182 to 200 feet must be preserved. Most of the weirs are below low water mark. The foundations remain, but the poles are taken down at the end of the fishing. The poles are 28 feet high. Shad taken when they come in are hard, firm and good condition, both males and females. Later, as the water warms, they become softer, and later still, when spent 'come-backs,' they are not fit to eat. Then about July 1 they are sick, soft and spongy, and unfit for food. They fall to pieces, yet people will eat them because they are large, and they will buy them. Outside caught fish are smaller, and people think them less valuable, but the big fish are really inferior and of no value. Shad go up above Fredericton, but mostly up the Grand lake, Washademoak and Ormocto, and up inland, swampy places the shad make for in their ascent. A close season is desirable for the River St. John and tributaries, say from June 5 or 10 to April 1 of the following year, thus allowing two months' fishing. We would get more fish about the beginning of April, but the taking of 'come-backs' must be stopped. The season suggested would not apply to the fall shad. The feeling I have is that it is not right to catch spawn fish until the last of July. But fishermen are after the dollar. I say, allow a few fish to escape and the fishery will be preserved. I would not close all down, but make a close season for the St. John harbour and river fishermen. I would agree to a close season from May 30 or June 1 if necessary. Two-thirds of the fish are mother fish some years; other years not so many are. The present sale of poor fish, alewives or gaspereaux and shad, simply injures the market. Now, 12 or 15 years ago up-river fishing was simply for domestic use and local sale, mostly smoked. It was a small thing 25 years ago, and no one barrelled and shipped them for distant markets as now. Small shad occur late. Last night, October 9, I got two small shad with my catch of herring, and one man got half a barrel, some as small as alewives and some bigger. Sturgeon were plentiful formerly and they tore our gaspereaux nets. They were difficult to get out and were looked on as a plague. We began to realize their value 22 years ago.

After four years, I fished two myself, they became so scarce that fishing for them was unprofitable. We used to get 12 or 15 sturgeon in a night, each five to seven feet long. They were chiefly caught up Long Reach, but indeed all up the river. I am chiefly interested in gaspereaux and other work engages me after that is over. These fish, gaspereau and shad, should be preserved. This year they have so diminished that it will not pay to fish, and the property we have will be valueless. The cause is the lake fishing on the spawning grounds. Of course, it is hard to say to my neighbour up the lakes, 'You shan't fish,' but he farms. I have no farm, and my livelihood is at stake. He fishes for the ready cash. We found when we went to McCormick's Cove, on the Kennebecasis to get gaspereau, that it is sheltered from the north wind; there is a high bluff and still water, and it gets the southerly sun. If the winter is long and the weather is fine the fish come in there, and if a cold spell follows they collect in deep water. After Christmas they fish for the gaspereau through the ice. As we can get nothing here we go up there and set our nets about April 1 to 10, or even as early as the middle of March, and finish about April 25. The river raises then and we come down to the harbour. The day the ice clears out of St. John harbour out the fish go up there. Such fishing up the river should be stopped till April 10 and allow it till July 1. Those fish got early under the ice, having come in from the sea, when the ice is forming too, are the mother fish or parents, and they are becoming fewer every year up there. In spring the Lorneville men get the gaspereaux from March 1 to 10, and on April 1. We get them in the harbaur as a very rare case in February. It would be best to make any restriction general. Herring will replace the gaspereaux while the restriction is in force. Something is injuring the fish, as they are getting scarcer. The fishermen are unanimous that it is the fishing on the spawning grounds that is the cause. A shad hatchery would be a good thing, as the salmon hatchery has improved the salmon supply. The shad would benefit by hatching.

James Paterson, Fish Merchant, St. John, I have handled the catches of the fishermen for 35 years, both fresh and salt fish. The supply of the shad is a thing of the past comparatively. Formerly one day's catch equalled what I get in a whole season or even two seasons now. I got 4,000 shad in one day formerly, but did not get 2,000 shad the whole of this year. They were scarcer this and last year. Last year was a fair gaspereau year, but this year was much poorer. The first fish in from the salt water are hard and in best condition, they are called 'ice' fish and we pay 5 cents each to the fishermen, they are the mother or spawn gaspereau and are a luxury. The real demand only begins when they are $1 a hundred. No gaspereau are got by our men before April 1. The best or early shad sell for 3 cents or 4 cents each, the fall fat shad are salted at $10 or $11 per half a barrel now whereas ten years ago shad were $5 per half-barrel. We send a good many shad to Boston and half-barrels here and there through the province. Three or four barrels go to Moncton, Amherst, Sackville, Fredericton and Montreal. The buck-fish are sold in St. John, but the roe or female fish, two-thirds of the catch, are sold in U.S.A. Because of large size they sell there well and they give as much for the roe as for the fish itself, viz., 87 cents wholesale. The proposed total closure is too severe and extreme. The fishermen see the necessity of giving a little now. The spawn fish must be protected and capture prohibited. I would not handle or buy spawning shad as they are not fit to eat. It is not detrimental to take the fall shad, they don't come where they can be slaughtered, and they are very shy in tidal water. They are in good condition. The 'come-backs' would be protected by the same season as urged. Even 'come-backs' are scarcer. There are very few small shad. Formerly no one would take them because good shad were plentiful. Shad swim near the top of the water and men when drifting suddenly see them go down as soon as a gun is fired. Thunder means a poor day's fishing. Noises disturb them, and they go like a flock of sheep no one leading. The young go astray. The dredge has dumped mud outside the harbour and the fish are kept away. At

Black's harbour quite a few have been taken. No doubt a hatchery or two would be a great benefit and the fish would be restored if the material could be collected to run them. It might be well to start a small one.

J. F. Belyea, Dominion Fishery Overseer said: that the decrease in the shad began with the big gun firing at Fort Dufferin. The continual practice drove them away. The early mother fish go up the river first when the fine weather comes. They go to McCormick's Cove and their spawn deposited in deep water is lost, unlike the later fish which go to the shallows and the spawn is not lost. The parent fish lead the young out. Recently the young began to stay in the harbour all the time because there were no old fish, no big fish to lead them. Just as large black salmon descend at the same time as the 'parr' so the 'racers' and the young shad descend together. It is rare for a racer to be seen on the market as no one will buy them and they are often dumped out. Formerly if the up-river men got fish they could not market them, but now they can sell them. Hence the fishing formerly was limited. The early fish are fished for by dissolute characters and a lot of nets are destroyed. In the early spring the men go out but they can't drift outside, because there are so many cross currents. There may be a strong tide down and an up-tide on top. Small alewives were caught this year, but there is no regulation to meet it, *i.e.*, to save the big fish only. A door is no good and O'Brien's fish escape not worth anything. There were so many small fish in some weirs that I got the men to open their weirs and let them go. I got them to put a gate in the weir. The fish retained, all die. A 2½-inch mesh extension measure vertically is good. Fishermen have been careful of small fish and small sturgeon. They liberate small sturgeon and lamper eels, the latter do no harm and do not destroy fish. It would help the officers if the term foul or unclean fish (shad and salmon) were defined, officially.

Murray Stackhouse, Fisherman, Carleton, said: I have experience with drifting and weirs and fish for shad, alewives and salmon. In winter I have other work. Shad have become scarcer for twelve or fourteen years. Gaspereaux never leave this harbour, any fine day in winter they can be caught. It would not pay now to fit out, but we have boats and gear. When the 'come-backs' descend there is a big run all at once, they rush past. There are two runs of tide and we may get 100 or 200 'come-backs' at high water at dusk, *i.e.*, slack water. Coming dark and coming daylight are the best fishing time. Fish stop in Grand lake and the men set nets on the thoroughfares and set right across. The local men up there have more chance to get them than we have. Day told me that he fished fifteen or twenty short nets and got 200 barrels of gaspereaux in a season, and he wanted me to go up and fish with him. On Little river the men set nets at dusk and after lifting the nets, clean the shad and then go to their farmers' work. Eels eat the fish meshed in the nets. The way the salmon hatchery improved the salmon supply shows that a shad hatchery would be a great benefit. I agree in the main with Mr. Harned's evidence. It is what nine out of ten of the fishermen would say if present here to-day.

Twenty-ninth Sitting.

School House, Lorneville, N.B., Oct. 12, 1908.

Professor Prince, Mr. S. F. Morrison and Mr. S. Melanson, Commissioners, opened the proceedings, and there was a very large attendance of fishermen, residents of the locality. Evidence was taken as follows:—

Robert Evens said that shad had not fallen off so much; I give you the figures from 1899 to this year:—

1899—6	boats caught	4,969	shad; the price I paid was	6c.
1900—5	"	5,349	" "	5c.
1901—7	"	992	" "	10c.
1903—7	"	6,229	" "	7½c.
1904—10	"	3,107	" "	10c.
1905—11	"	4,059	" "	12c.
1906—11	"	2,835	" "	16c.
1907—11	"	3,045	" "	18c.
1908—12	"	4,310	" "	18c.

The average for a boat in 1899 was 828 shad, and in 1907 it was 277. They were all spring shad, the fish being mostly taken from May 18 to June 5, a day or two earlier or later. After June 1 the fishing comes to an end as a rule. I had handled shad before 1899, and I paid before 4½c. to 5c. each, but that year paid 6c., and this year 18c. It has been a good year, and the average fish were finer. I got very few fall shad. In 1901 stormy weather made the catch small. Some of the United States shad rivers have played out, and we seem to get more fish. Since the Kennebec river played out we have got improved catches. This spring shad brought the best price There were fall shad here then. These fall shad would have spawned the last of May or early June. I show you here (addressing the Commissioners) a shad of the late run got below here. They were got at Deadman's, Lepreaux, Charlotte county, opposite the mouth of L'Etang river. The spawn is half grown and they may be Florida shad. They are not got up the bay. Thirty-six or 38 of them were caught, *i.e.*, about a half-barrel. Our spring shad average 48 to 52 to a half-barrel. The Kennebec river was the last United States shad river to give out, and the high price this spring proves that shad are scarce, and as some say not as plentiful as they once were. The spring shad are passing along our coast to reach the St. John river. If you salt them you see no fat in the barrel. The milt shad, 3 pounds weight, have no fat in them. The she fish are about 5 pounds in the round, and we pack them on their backs in the barrels for Boston putting ice between each row of fish. I never heard of spawn shad got above St. John river. Those passing here go pretty quickly, so that two weeks cover our fishing, hardly averaging 10 nights a year, as storms interfere. We use 5 and 5¼-inch mesh, but 10 or 12 years ago we used 4½, but not now. The few fall shad were brought here, and I bought them at 22c., about 500 altogether instead of the fishermen delivering them at Connors Bros. They were got 30 miles below here, the size being 36 to 38 to the half barrel. Last year a few of the same fish were got, Messrs. Connors getting probably 6,000. We used to get some small shad, 48 to 50 to the half-barrel, uniform in size and fat, much fatter than spring shad indeed, there was a couple of inches of pure fat at the top of the barrel. We can handle an unlimited quantity of spring shad, all our market being for fresh shad. They are no good for salting, only a few being salted formerly. I got 5c. and 5c. duty was paid and freight, and the fisherman was paid 8c. per fish by me. One spring shad is worth two fall shad, as it is the roe that sells the fish in the United States. Spring shad have taken the place of their shad, now scarce or extinct. Messrs. Connors sold their fall shad in St. John. Now there are not enough shad to supply the demand. As to 'come-backs,' they go out into deep water and very few are got; just a few with the salmon in salmon nets. All the shad rivers north of Florida have given out, and two years ago the Kennebec declined till no shad are got there. As the number of boats increased the shad decreased. The first salmon here are taken about June 5; some boats out June 1 took some. The salmon have increased since hatching has been carried on. Before that there had been a failure for two or three years. The largest this year were 36 pounds, the smallest three pounds. Any-

thing below eight pounds is a 'fiddler.' The average salmon are 12 pounds. I pay the price of two salmon for the big ones. There are so many large ones, over 50 of those I handled being 20 pounds weight, whereas formerly five or six would be all that would be taken. I get about a quarter of the local catch, *i.e.*, 16 boats as there are over 60 boats at the salmon fishery. I handled 4,000 fish, averaging 12¼ pounds each. The men here used to use 6½ or 6⅞, but now they use 7 inches or 6⅞. The fall shad I may add come up to feed.

THOMAS GALBRAITH said: I have a farm, but I fish chiefly for shad, salmon, gaspereau and a few herring. I fish very little for haddock. The scarcity of shad is difficult to explain, as our catch is a row of pins only compared with the whole fishery. Formerly 1,000 shad would be a boat's catch in one night of fall shad. That would be forty years ago. After that fall shad dwindled down till only one boat fished them here. No one fished for spring shad though plenty occurred. Fifteen years ago the shad increased and for four or five years the fishing was again good. Then spring shad fishing began and they brought 4 cents or 5 cents often as low as 3 cents, but before that we could not sell them. For seven or eight years fall shad have been very scarce and spring shad too. The demand for spring shad increased and more money is made out of them than out of fall shad. We get for them 20 cents instead of 4 cents. The few fall shad we get in the salmon nets we thought were coming down from the head of the bay, Windsor and other places. They appeared about July 1, and were not large but fat. They seem to go down beyond Lepreaux. An odd 'come back' or poor shad we take, and of large size, also we get 'racer' salmon. The spring shad of St. John river have nothing to do with our fall shad here, they don't come out of the river until after our fishing is over. The fall shad are shy and don't feed on shrimp, there is no red feed there but at Deadmans the shad were feeding on red fish or shrimp. Our drift nets are 5⅛ and 5¼ inch mesh, 40 meshes deep, 420 fathoms to a boat, and they are fished at the surface of the sea. The shad here swim at the surface, but down this side of Eastport they swim deeper and are caught in the deeper meshes of the net. They are fatter and softer and don't keep so long. They mesh at one and a half or two fathoms there.

JOHN MCCAVOUR said that each locality had its own run of fish, every shad like the salmon returns to its own river to spawn. The spring shad differs from the fall shad as the latter has a spot but not the former. I think that the Florida shad come here (fall shad) and go back as the people from here followed them back clear to Cape Florida some years ago when fall shad were plentiful. Both spring and fall runs are caught out that explains their scarcity. Formerly there was no demand for spring shad and we never put out our nets till the fall run began. The mesh of salmon was too large and shad went through, so not many were seen or taken. Years ago 1,000 fall shad would be taken by a boat during the few weeks fishing. Only fifty shad taken this year by a boat, most less than that, though some boats got more. Twelve years ago I began fishing in spring and ever since it has declined. I caught 2,000 the first year, and say 1,000 a year for the next five or six years, only 300 this year, but some men only got 200. We only fish from two to ten nights, and it is the high prices in the States makes it pay. The decline is due to the shad being caught and prevented from spawning.

JAMES MCPHEE said: I have fished 23 years and never missed a season. I fished in the spring at first, but prices were low, only 3 cents to 4 cents each. I fitted out for myself eighteen years ago and it was a good season, 400 shad being the catch (one boat), and the same fall 5,000 were also taken, but I had two boats in the fall and hired a man to help in fishing. We sold the catch fresh to Patterson and he said he had received so many shad that we must stock some. We got fall shad from August 1st to the end of the month, sometimes going on till September and October as a few

shad still ran. If the season is good the run is late and the average size large, but the fish are small when the run is small. Twelve years ago I got 800 one night, they were well off shore. The first year the falling off began there was gun firing at St. John, and ever since much mud has been dumped into the water, while pulp mill waste gas waste, &c., have been an injury. When the guns fire or there is thunder we get no fall shad. We all know that shad are getting scarce, and it is hatcheries that are wanted. If hatched in St. John river they are bound to come back. We get poor shad 'come-backs' not more than three or four in a year. They are taken by salmon nets four, eight or ten miles out. If shad fishing were stopped in every place for five years it would be best for improving the fishery.

Samuel Gwenn, Musquash, said: I am a fisherman and I farm a little. My father caught lots of shad on Musquash river in the salt water up the river, but in my time no shad occurred. There are two mills now, but formerly three, twelve miles up, and they dumped in their sawdust, and there are dams at the mills. The river is one mile wide where the shad were taken.

George Ferguson, Lorneville, said: I knew the shad fishing 30 years ago and for ten years (down to twenty years) the shad were as scarce as now. Then eighteen years ago they improved, and sixteen years ago a man would take 3,000 fish in the season, sometimes 950 in a night. They kept up good for four or five years, and then for ten or twelve years they have dropped off. It was fall shad fishing formerly then later twenty years since spring fishing began. We use 40 mesh nets but 38 formerly. Spring shad swim deeper than fall shad. I have seen shad as small as sand jumpers. At Black's harbour I have seen little shad four inches long, showing the shad spots on them in the weirs, in the fall I think when salmon were being caught. The fishery would be helped if spring shad fishing were stopped but the St. John harbour weirs would take them and can't be stopped as the city has fishing rights. Shad fishing is stopped on Friday nights but the harbour weirs are made an exception it is said. Of course, spring fishing must cease on the United States coast rivers or full benefit will not follow and international regulations should be made.

George H. Galbraith said that spring shad are always larger than the fall shad, but the latter may not go up for a year to spawn. Fall shad must have spawned somewhere. The 'come-backs' go into deep water on reaching the sea. We get a number of spent salmon in shad nets but not in salmon nets. We have got salmon from the government pond, St. John, but never noticed any marks on them. We got cod with a mark on the tail and fin cut off. They are cod from the Main United States hatcheries because we see the fins have been cut off. I did not get them myself. Eels and pickerel damage salmon spawn and hatcheries for shad would have the same good results as salmon hatcheries.

James Reid said that some men took salmon all the time and observed no Sunday close time. This ought to be stopped. Three hundred salmon have been caught on Sunday and we who keep Sunday are at a disadvantage. The late inspector did not enforce the law. The fish thus cannot get into the rivers. The time should be longer viz., 7 a.m., Saturday to 3 p.m. Monday instead of 12 Saturday to 12 Sunday night.

Thirtieth Sitting.

COURT HOUSE, DORCHESTER, October 14, 1908.

The sitting was opened in the usual formal manner by Professor Prince, as chairman, and Commissioners Morrison and Melanson followed with some introductory observations.

FRANK L. DOBSON, BEAUMONT, formerly of Boudreau's village, stated that he was born and brought up where the shad fishing 25 or 30 years ago employed eighty boats in a mile of the river. No doubt over a hundred boats in all in the locality. The catches weekly from Sunday to Wednesday were often 1,500 shad to one boat with two men. My uncle would get 1,200 going down as far as Grindstone island and then coming back for salt when he cured them or left them for some one to cure while he drifted down again. If only 500 or 600 were got in three days fishing it was considered a poor catch. The boats were full of shad. There were no regulations. The shad fishing was from June 20 to Sept 30 or even into October. The run was extra large and fat, but about the middle of the season they were thinner and smaller. The September shad were prime, and my father was under a bargain to pick out the best shad at 10 cents each, and he always made up a barrel of September shad for himself. There was little sale for fresh shad and they were exported salted down. We supplied the salt. They were repacked in barrels and shipped to New York and other United States markets. The residents practically made a business of it and between cropping time and harvest they fished shad. A man could have as large a net as he could handle, viz., about 250 fathoms. Drift nets were principally used but weirs were built which were not a success. One was built a mile or more from the mouth of Petitcodiac river on the east side of brush for shad. Stake nets down at Grande Anse took shad and salmon. As to small shad I have seen small shad three inches long in the pond of the quarry of the company of which I am manager. These small shad come in from the Petitcodiac river, they must come down the river. I saw some this year in August or latter part of July, two or three on several occasions, some being dead. The pond water is sea water. One I found the other day fast in the derrick chain which the tide covers. It was nine inches long and got fast and was left after the tide had gone down. The shad in the middle of the season were smaller than the first run and the last. Memramcook river dries up at low tide. Shad was our staple fish and its low price put it in the reach of everybody. I feel very much interested as shad are a fine food for the whole people, and the sale helped the poor people out. I like them better than any other fish. The shad fishery benefited the fishermen, the working people and were a benefit all round. I may add that shad were got at the spawning season at the tail of Holme's mills on Petitcodiac river.

S. L. CHAPMAN, DORCHESTER, said: I carried on a correspondence in the St. John *Telegraph* from eight or nine years ago to five or six years ago on the matter of the north shore (Bay des Chaleurs) shad. Officer Hetherington joined in. I have known the shad industry for forty years and was interested in a boat as well as handled shad. The price split and trimmed was 3 cents and they were peddled all round for 4 cents, but 25 cents is now the standard price—sometimes 35 or 40 cents for roe shad in spring for St. John shad. This year the supply only continued one week. There are different kinds of shad, the St. John river shad and this river being identical, some of them being male and some unspawned shad, but the north shore shad are a different shad, being an ocean shad, like the ocean sturgeon which differs from the lake sturgeon. My opinion is that shad migrate long distances, but the local varieties remain distinct. The skeleton of the north (Chaleur) shad is more stable and more heavy so as to resist greater pressure as if it was a deep-water fish. Shad return to our rivers as the temperature cools. The fall shad are not mature and have not spawned, but next

year they will come back as spawners. I believe we must co-work with the United States government in this shad matter. It is no good for us to work alone. Both of us must stop taking roe shad. Before July 1 neither country should take shad for three years. Second, for four days no shad should be taken each week and allow fishing on Monday, Tuesday and Wednesday. This would allow the men to work on their farms. Third, weir fishermen should be on the same footing as drift net men and should open their gates and fish three days only or have the option of having a mesh to take cod and sturgeon. Fourth, abolish set nets as those here and at Minudie don't pay or make any money. Salmon are taken in shad nets and if shad nets are allowed after August 15 on till September you can't help illegally taking salmon. October salmon are not fit to eat, the colour has changed to white, all the pink gone. Fourth, prohibit the capture of spawn shad and stop it in both salt and fresh water—Oak Point in St. John river is salt water. Here salmon are only caught very occasionally and don't amount to anything especially after August 15. In July 850 shad were caught in Petitcodiac river and 150 salmon in the month of July. The main time for salmon is July 6 to August 15. Thirty years ago lots of shad were caught up to October 30. They got forty at a tide about the first week of October for home consumption. Old LeBlanc took them. All depended on the high tide and if it was in the first part of October then the shad came in.

Thirty-first Sitting.

Gardner's Creek, N.B., October 15, 1908.

Professor Prince and Commissioners Morrison and Mclanson opened the proceedings in the usual way, and evidence was then taken, a very large number of local fishermen being present:—

John Barker said that he had known the shore fisheries for 60 years and formerly herring were too plentiful, but declined 10 or 12 years ago and had now gone. Lobsters were the principal fishery in this locality. There are many salmon here in the fall, coming into the creeks to spawn, such as Tynmouth creek. There is no salmon drifting here. A few herring set nets are left but they catch little. Mackerel are sometimes taken in the herring nets as there is a small fall run, perhaps a barrel or two in a night. Dog-fish are a trouble and I have known 60 or 70 dog-fish on the hooks and only 15 or 20 cod heads, for the bodies of the cod had been eaten off.

Robert Wallace said that he was formerly a ship builder of the firm of W. & R. Wallace. He had known the shore for 55 or 60 years. Pollock, cod, herring, mackerel and lobsters, but no shad, are the fish around here. There are salmon but no one fishes for them, but we see them jumping on fine days at the last of August and in September and October. No doubt they are up the rivers in November, and some are speared in streams, 16 pound weight some of them. Sixteen salmon were got on this beach. In herring nets small ones are got occasionally, say 2 pounds weight, about 16 inches long. There are not the fish here we once had, but we have no grievance and are satisfied, though we favour more hatcheries. Salmon are increasing owing to the government hatcheries, and the lobster could be increased in the same way.

John Harding said he made his living by fishing, but has a small farm a mile away. The principal fish are pollock, but haddock are scarce though plentiful formerly. There must be shad as they pass here to reach the head of the bay. This is the shore they go up to reach Parrsboro and Moncton waters. No one ever fishes for them. The salmon nets take many shad off Cape Spencer, 7 miles below here. We have no

nets for shad. This shore goes off bold rapidly and is good for lobsters. In spring lobsters are handy close inshore in 5 fathoms, but in winter they are in 20 or 22 fathoms and are carrying spawn. We sometimes get 15 spawn lobsters to a haul, and they are always very large. I fish six months in the year lobstering. There are no shad fisheries between here and St. Martin's. Spring shad are taken in a 6-inch meshed net drifting in May and June, as they fish salmon at the same time and finish on to 15th August. In Charlotte county sardine weirs shad are taken 100 at a time at Lepreaux. Two years ago I saw them in the fall, say September or October, taking shad, but they are smaller than spring shad. Dog-fish are plentiful in July, every hook having one and they are put on the land. We favour a lobster hatchery. Scallops are found near here.

George Kirsop stated that he was fishery guardian and agreed with what had been said by previous witnesses. More spawn lobsters he found occurred from May 1 to the last of June, when the weather is warm. The spawn lobsters should not be shipped away to the States but kept here and our own waters stocked with their spawn by means of a lobster hatchery. Black river, three miles from here, is a good location. Salmon and most of our fish would pass through a 6-inch mesh.

Richard Dare said he had fished lobsters over 12 years and pollack as well. Our boats are small for fishing out in the bay. We just use hand lines and fish off here. He agreed with the preceding witnesses in their views. He found dog-fish exceedingly plentiful in the locality.

Thirty-second Sitting.

Victoria Hall, St. Martin's Hall,
St. Martin's, N.B., Oct. 15, 1908.

Professor Prince, Chairman, opened the sitting in the usual formal way, and Mr. S. F. Morrison and Mr. S. Melanson, commissioners, also gave brief opening addresses, and there was a large attendance of fishermen and others.

A. F. Bentley was the first witness. He said I fished shad long ago in Nova Scotia at Five Islands. I consider shad one of the most valuable of all our fishes. Fifteen or 20 years ago it was a remunerative fishery for the fishermen and valuable to the public. Thousands of barrels were caught. It was the thing which brought money to the people, and some fishermen I know realized as much as $2,000 a season from shad fishing. I moved down here, but I hear that shad are now very scarce, bringing $8 to $11 per half-barrel, but some seasons as high as $12 a half-barrel. I consider shad to be one of the best of fish. Fresh there is no fish better, and salted it is equal to mackerel. As a boy I remember that 4c. was the price of a shad and later 25c. If the government can do anything to increase the shad they would be doing one of the best things that could be done for the people.

John Kane, St. Martin's: I have fished up Shepody bay for 30 years, and I used to get all the shad I wanted. I fished during the shad season and worked at other things other times. I used both drift and set nets; both gilling the fish, but drift nets are used in deeper water. We got shad the first of the summer, June and in July and August. We got big shad, and I cleaned them and got spawn in them.

James Bourke, St. Martin's, said he had lived here 40 years and knew the shore up to the head of the bay. No shad were taken off the shore here, but in Cumberland bay and Petitcodiac river shad were plenty. The water is clear on our shore, more so than off even Point Lepreau, and I think that shad are most plentiful on the south shore. Of course, lots of shad are caught at Mace's bay and Dipper harbour. Lots of herring got here in buoyed anchored nets formerly, but have declined during the last two or three years. They don't compare with their former abundance. They were salted down and shipped to St. John, N.B. Cod, pollock, mackerel and lobsters are the main fish here, especially the last; quite a lot taken. A business is not made of fishing now as it was formerly. The desire is to commence lobstering earlier, viz., September 1 instead of January 1, as ice prevents fishing early in the year. Our lobsters are a good size; some small ones occur. The size limit should be the same as in the next county.

Robert Conley said that 25 or 30 years ago shad were plenty, and 50 barrels were taken out of a weir at Alma, while good catches were made below Point Wolfe. It was quite an industry, but 15 years since they became scarce. Sawdust was blamed as the injurious cause. Herrings were taken a little later than the shad at Point Wolfe. No shad or herring were taken below Martin Head. Shad occurred in June and July and into August.

Benjamin Black said that formerly there were weirs westward of Quaco, and as many as 20 or 30 barrels of herring were got in one night in a brush weir 40 years ago.

Squire Skillen, St. Martin's, said he was formerly a fishery officer for the district. Lobster, cod, haddock, halibut, pollock, hake, a few mackerel and herring, which used to be quite an industry. Pollack are got in large quantities. Herring, of which large catches were made every season, fell off because sawdust began to cover the feeding grounds from the mills. Dog-fish were as plenty as now, yet hundreds of barrels of herring were got in a night, indeed 150 barrels of large fat herring were taken in a brush weir in one night. In the 70's and 80's about 150 fishermen engaged in herring fishing in this district. I have not had charge of the district since 1889. No shad were ever caught here, but very fine ones were taken at Martin Head, 20 miles above here. The last shad there were taken in 1881 or 1882, but probably shad were there after, but the weirs were not fished. Shad vary locally, as the Nova Scotia shad (Scott's bay) wholly differ from the St. Johnn and Pisarinco shad. Economy shad were fat, heavy fish, as compared with the thinner, poorer shad taken on the New Brunswick shore. I once saw a big catch of shad taken in one weir at Scott's bay on a Sunday morning in July, 1882. At that very time I was settling a dispute at Spencer's Point (the matter of Mitchel of Deer island). Mitchel had a fine catch of shad, and he had taken a large horse mackerel (Tunny). The local people objected to the intrusion of Mitchel and his being given a weir stand. In Cumberland bay (Joggins) shad were got in October, later than on Economy shore As the shad of the other shore are thus later, I expressed the view to the Mitchels that they were our fish from this shore which migrated there, but they said 'No,' and they spoke of two distinct varieties of shad.

John Howard, St. Martin's, said that he had been a lobster fisherman since 1892. In their average size and quality the lobsters in that locality were the best in the Bay of Fundy. We sell to Eastport buyers fresh, their boat coming up here from Eastport in the spring, but in winter they are shipped in barrels to Boston. There are no canneries. The price from April 1 to June 30 averages 13 cents, a low price, but in 1907 they averaged 16 cents each. The season by law opens too late (January 5) as it is so rough on the shore we cannot fish, and owing to ice, &c., we lose our gear. The sea-

son ends on July 1. I would like the fishing to open on November 1, but Dr. Pugsley said he would almost fear asking for it to open so early. We see a great many spawn lobsters, two-thirds are females. There are just as many one time as another, as we noticed no difference from December 15 to July 15 when we have had extensions, some in mid-winter as middle of summer. We see light green and dark green spawn at every time of the year. As to size I would rather see the 10½-inch limit enforced as a uniform regulation in St. John and Charlotte Counties. Besides fishing I farm as well. Only one man fishes salmon, Mr. Bradshaw, and I think he uses a 5½-inch mesh. Salmon are plenty for I see them all over the bay jumping, and good hauls are made by Pisarinco boats which come up here about August 1. Salmon are very thick in this bay. The streams along the shore are full of salmon now, at this very time. Some large salmon occur, one of 24 pounds being killed in Tynmouth creek. Small herring were plentiful this fall, and cart loads here were made into manure, they were sardines. I have got big hake stranded on the west shore where I live, the hake chasing the herring ashore to feed on them and both silver hake and herring stranded.

APPENDICES.

APPENDIX No. 1.

Recommendation made by the Fishery Inspectors of the Dominion at a Conference held in Ottawa, April 9, 1891, with extracts from the minutes of the Conference.

That a close time for shad be established for Quebec, Nova Scotia, New Brunswick, and Prince Edward Island, from March 1 to June 20, with weekly close time, as at present.

The regulation now in force provides a weekly close time for shad and gaspereau from sunset on Friday evening to sunrise on Monday morning; the fisheries within the harbour of St. John, N.B., being, however, exempted from the above provision.

It is held by many who have given this subject serious attention that the above close time is sufficient to properly protect the shad fishery; and it is also claimed that the exemption of St. John harbour from even the slight protection afforded by the weekly close time is most injurious to the shad fishery in other localities.

The Bay of Fundy, with its tributary rivers and streams, is *par excellence* the shad fishing ground of the Dominion. In 1890 the catch amounted to 6,428 barrels, valued at upwards of $65,000. Of this quantity nearly one-half was taken in the county of St. John, N.B., almost altogether in the harbour of St. John.

Throughout the Dominion the catch of shad in 1890 was:—

Fresh shad	108,103 lbs.
Pickled shad	6,728 brls.

representing an aggregate value of upwards of $73,000.

At various periods during the present century, the condition of the shad fishery became a source of much uneasiness and concern to the fishermen of Nova Scotia and New Brunswick. It has periodically, but at certain intervals, proved a total failure, but again and again the fish returned to our shores in abundance; and it was not until comparatively recent years that this fishery has showed continued signs of depletion, and the urgent necessity of more stringent regulations forced itself upon the convictions of all observant and thoughtful fishermen.

In 1875 the value of the shad fishery of the Dominion reached $133,975.20. In 1880 it stood at $89,429.15. In 1884 it fell to $74,058.41, but rose during the following season of 1885 to the phenomenal value of $149,174.90. In 1886 it fell to $109,896.60; in 1888 to $70,355, and in 1889 to $58,364.80.

With an increasing scarcity, the price of this fish gradually rose until what was not very long ago an important article of diet among the poorer classes of the population, has now become comparatively scarce. The fish which sold at $6, $7 and $8 a barrel, now fetch $12 and $14.

The shad is essentially a salt water fish. Its annual migrations northward and into the mouths of our rivers have been ascribed to various causes, the most acceptable theory being that there is a certain temperature of the water in which fish of migratory instincts prefer to live, and that they aim to occupy a hydrothermal area of this special temperature; hence the movement of those fish in the spring months and early summer from the warm waters of the Atlantic off Florida and South Carolina as far north as the Gulf of St. Lawrence.

Shad enter the Bay of Fundy about the middle of May, proceeding up the rivers and streams and returning to the salt water in August or by the latter part of July. They are then thin, emaciated and weak, after spawning. The young ones move down to the sea in September.

One of the fishery overseers in Kings county says:—

'With regard to the general falling off in the shad fishery in the waters of the Bay of Fundy, there is a local cause which I think must affect the fishing injuriously. I refer to the practice of drifting for herring across the mouth of the bay. Usually, every summer, from six to eight vessels, each having at least two sets of nets, string them two or three tiers deep right across the mouth of the bay. It appears to me that this practice must have the effect of breaking up the schools, or turning them away, when they go up through the Gut; they are thus lost to the bay.'

Overseer Burnham, of Windsor, N.S., writing on the subject says:—

'I believe that over-fishing is the principal cause of the decline of shad in the Avon.'

Mr. W. H. Rogers, late inspector of fisheries for Nova Scotia, made several reports on the subject; the gist of his remarks and conclusions being that over-fishing was the real cause of the scarcity of the shad at the present time.

Among several authenticated statements presented to the department in connection with the decline of the above fishery in the Bay of Fundy, may be mentioned the following:—

Casimir Bourque of Minudie, fished in

1882	with	8	nets	and	caught	150	half-brls.	of shad.
1883	"	8	"	"	100	"	"	"
1884	"	8	"	"	70	"	"	"
1885	"	16	"	"	60	"	"	"
1886	"	16	"	"	30	"	"	"

Wm. A. Downey, fisherman, also of Minudie, states that in 1882, his average catch per net used each tide, was 55 shad.

In 1883 it was only		10
1884	"	6
1885	"	4
1886	"	3
1887	"	3

From the above statements, and reports, it is evident that the shad fishery has much retrograded of late years, and it appears most desirable that efficient measures be adopted to give it the necessary protection.

APPENDIX No. 2.

STATEMENT FROM FISHERY OVERSEER J. W. DAVISON, BASS RIVER, N.S.

To Professor E. E. Prince, S. F. Morrison and S. Mclnnes, Commissioners appointed by the Government of Canada to investigate the matter of the Shad Fisheries of the Bay of Fundy.

GENTLEMEN,—I thought it might not be out of place for me, as Overseer of Fisheries for this part of the county of Colchester, to give you some of my views with reference to the very important work which has been entrusted to you by the government of Canada. My knowledge of the subject is practical rather than theoretical, but if I can say anything to help you to come to a satisfactory conclusion with regard to this most essential matter I shall be greatly pleased to do so.

1st. *Re* the history of the shad fishery in this part of the province of Nova Scotia. Our first knowledge of the subject comes to us entirely from verbal reports, as there is no person now living old enough to remember when shad fishing began here. However, our fathers and grandfathers have told us that the first settlers procured shad for their own use in holes and crevices in the sand bars, near the head of Cobequid bay, at Folly village and Masstown, where they had been left by the ebb tide. This was about one and one-half centuries ago, so that I have no doubt the history of the shad fishery extends back to the time of the earliest settlers in this part of the country (over one hundred years ago), the people contrived a method of capturing shad particularly suited to a new country, which at that time was all grown up with woods, viz., by brush weirs, a method still in use, but how much improved I do not know. However, there has been a very essential change in the location of the weirs, which at that time were set very near the beach, or rather, I might say, near high water mark of the tide. Now we find that we cannot catch fish without going almost a mile and in some places two miles.

For a number of years the above was the only method used to catch fish here, but in the year 1848 Mr. Halliday, an Englishman, came to Economy for the purpose of fishing, which business he prosecuted with success for a number of years by means of boats, carrying gill nets with which he drifted for shad. In the meantime, the natives of Economy adopted this method of fishing and they too were successful, so that the number of boat fishermen went on increasing until there were a great many engaged in the business, and the boats began to carry longer nets until from nets 150 fathoms in length a boat would carry a net 300 and sometimes over 400 fathoms long. The number of weirs also increased until instead of 3 or 4 weirs there were over two dozen, yet the average catch of the boat fishermen did not seem to be lessened by the catch of the weirs so that great numbers of shad were taken from the bay. The most prosperous time in the history of the shad fishery was between 1860 and 1880. Of the first ten years of that period we have no record, as there was no overseer nor any person whose duty it was to give statistical information until after the confederation of the provinces in 1867, and there was no person appointed to obtain full statistics until I was made overseer of this district about the year 1870. However, I was practically engaged in net fishing between the years 1858 and 1880, and was in full touch with everything concerning the interests of the fishermen of this bay. It was when the decline of the fisheries began that I gave up the business. This decline was gradual and rather slow at first, but for the last ten years fishing has ceased to be a real industry here, although a few boats are still in the bay fishing ostensibly for shad, but in reality getting principally salmon. When shad fishing was at its best, the

number of shad caught in my district was from 3,000 to 5,000 barrels. The following shows the number of barrels of shad taken in my district between the years 1889 and 1906, inclusive:—

1899	1,107	barrels.
1900	1,303	"
1901	269	"
1902	97	"
1903	314	"
1904	38	"
1905	30	"
1906	24	"

With reference to the cause of such a complete failure of the shad fishery, the first and greatest reason is, I believe, the destruction of the mother shad in the rivers when they are ascending to their spawning ground. These shad, which go up our rivers to spawn, furnish the supply for our bay fishery and if the mother shad are destroyed the natural result is that the supply for the bay is cut off. To prove that a great many shad are taken in our rivers I will give the numbers of barrels reported by the overseer to have been taken in the Stewiacke river between the years 1899 and 1906:—

1899	500	barrels.
1900	700	"
1901	600	"
1902	176	"
1903	310	"
1904	1,000	"
1905	400	"
1906	25	"

The above report would appear to indicate that not only has the taking of these spawn shad cut off the bay supply but that the destruction of life has been so great as to have destroyed the mother shad almost entirely. I know that there are some men who no doubt have carefully thought over the matter (I would refer to the late W. H. Rogers for example) who held the opinion strongly that the shad which ascend the Shubenacadie and Stewiacke rivers to spawn have no connection with the shad which supply our bay fishery, but were the products of shad which ascended the rivers far south and deposited their spawn early, then, later about the month of June arrived here fat; but he never ventured on an explanation as to what became of the spawn deposited in the Shubenacadie and Stewiacke rivers. Of course the fact of having fat shad so early after the spawning season seemed rather strange. Personally, I believe, that the shad caught in Cobequid bay during the months of June, July and August (that is the female shad) have not arrived at the age of motherhood for that year, but many of them no doubt will go up the rivers to spawn the following year and by so doing will propagate the species, while others will never live to ascend the river the second time. As to the theory that our shad go to the far south to spend the winter I have strong doubts. I believe rather that our bay shad go far enough away to get into deep enough water to secure them a comfortable temperature in which to spend their winter. Other causes which might be mentioned are over fishing, late fishing, &c., but I am afraid that I would weary you should I enter into a discussion of these causes fully, so will not try to write upon these phases of the question. I have already stated my views upon these subjects quite fully in my reports sent to R. Hockin, Esq., Inspector of Fisheries for Nova Scotia.

As to the date of arrival of shad in Cobequid bay, formerly when our shad fishery was in a prosperous condition, the shad arrived in sufficient numbers between the 10th

and 20th of June, so that our boat fishermen began to start out with their drift nets to fish, and if weirs were set ready to catch shad, they often got a few in the month of May: but the shad so taken were principally mother shad. Some few perhaps were not, yet they were very good shad.

Thanking you for your consideration, and trusting that the information which you have already received in your work and study of this subject may enable you to recommend the adoption of a satisfactory law, one which will result in the restoration of our fisheries to their former prosperous condition.

I remain,
Yours very respectfully,

J. W. DAVISON,
Overseer of Fisheries.

BASS RIVER, COLCHESTER COUNTY,
NOVA SCOTIA, August 15, 1908.

APPENDIX 3—Folly Village Sitting.

STATEMENT of Shad and Salmon caught by Mr. T. F. Morrison.

1874.	Shad.	Salmon.	1875.	Shad.	Salmon.	1876.	Shad.	Salmon.
July 3	90	1	June 21	138		June 24	41	2
" 4	167	1	" 22	66		" 26	44	2
" 6	245			116		" 27	63	
" 7	149		" 23	60	2	" 28	53	
	153	1	" 24	106		" 29	48	
" 8	190		" 26	119		" 30	33	
" 10	81	2	" 28	111	1	July 4	137	4
" 13	136	3	" 29	61		" 5	32	2
" 14	127	2	July 1	89		" 6	32	5
" 17	146	2	" 3	281		" 10	243	6
" 18	148	4	" 6	360		" 11	101	5
" 20	92	10	" 7	213	2	" 12	52	
" 22	178	10	" 8	278		" 14	55	7
" 23	129	6	" 9	111	1	" 15	50	7
" 24	92	6	" 10	209	3	" 17	59	3
" 27	175	4	" 12	131	4	" 24	105	18
" 28	133	4	" 13	87	3	" 25	51	19
" 29	101	2	" 16	291	9	" 26	34	10
" 30	131	2	" 17	54	5	" 28	35	20
" 31	239	3	" 19	320	7	" 29	32	11
Aug. 1	137	2	" 21	103	7	" 31	45	54
" 3	266	6	" 23	272	4	Aug. 2	21	4
" 5	146	3		172	6	" 8	73	6
" 11	235	5	" 26	162	5	" 10	36	
" 15	95	3	" 27	105	16	" 12	60	65
" 22	124	5	" 28	81	3	" 14	48	1
" 24	100	4	" 29	73	4			
" 25	41	4	" 30	52	2			
Sept. 2	55	1	Aug. 2	96	3			
" 3	64		" 6	116	6			
			" 7	80	2			
			10	79	3			
			" 11	67	6			
			" 16	89				
			19	34	3			
			26	89	2			
			27	65	9			

APPENDIX No. 3.—*Continued.*

STATEMENT of Catches by Mr. T. F. Morrison—*Continued.*

1879.	Shad.	Salmon.	1882.	Shad.	Salmon.	1883.	Shad.	Salmon.
June 21	165		Up to July	135	3	June	26	
" 23	259	1	July 3	162	1	"	42	2
	63		" 4	169		"	28	
" 24	186		" 5	62		July 3	37	
" 25	120		" 7	130		" 6	85	
" 26	140		" 8	73		" 9	123	
" 27	197		" 10	126	1	" 10	66	
" 30	305		" 11	94		" 13	57	1
July 1	170	1	" 12	113		" 14	71	
" 2	190		" 14	74		" 16	88	
" 4	227		" 15	117	1	" 18	53	2
	42		" 17	230		" 20	82	1
" 7	462	1	" 18	143	2	" 23	80	
" 8	148		" 19	118	2	" 24	193	4
" 10	217	1	" 20	94	1	" 26	89	6
" 11	232	1	" 21	48	2	" 27	67	6
	200	1	" 26	70	3	" 28	75	6
" 12	72	1		70	1		38	2
" 14	186	4	" 27	51	1	" 31	40	8
" 15	81	2	Aug. 6	72	3	Aug. 6	66	9
" 16	286		" 8	44	4	" 8	54	4
" 17	42	1				" 10	55	1
" 21	171	4				" 13	30	3
" 22	98	3				" 16	77	4
" 26	401	1				" 17	92	1
" 28	137	4				" 20	75	4
" 29	66	1				" 21	85	4
Aug. 4	139	6				" 23	99	3
" 16	39	9				" 25	66	3
						" 28	26	4

APPENDIX 4—Catch of Fish for 1908, taken by Mr. Sargent Stewart.

——	Shad.	Salmon.	——	Shad.	Salmon.
June 29	11		July 21		12
July 1	20	5	" 23	3	5
" 2	16	7	" 24	5	9
" 3	24	13	" 27	3	26
" 4	14	1	" 28	10	8
" 6	12	15	" 29		9
" 7	13	9	" 31	6	19
" 10	11	13	Aug. 1	15	15
" 11	4	3	" 3		27
" 13	20	8	" 4	1	7
" 14	13	7	" 5		12
" 17	5	16	" 6		10
" 18	5	14	" 10		5
" 20	6	22	" 12	1	5

J.B.M's. 225. Salmon 260.

Appendix 5—Return of the Catches of Shad and Salmon taken in 1861.

(Copied from the Census of 1861, from Nova Scotia.)

	Shad.	Salmon.	
	Cured.	Cured.	Smoked.
	Bbls.	Bbls.	No.
Halifax City	15	130	
" County	441	230	758
Colchester "	3,691	33	74
Cumberland "	652	33	21
Antigonish "	9	155	85
Guysborough "	81	829	30
Hants "	1,078	3	
Kings "	1,274	14	36
Annapolis "	53	30	103
Digby "	209	1	2
Yarmouth "	53	12	12
Shelburne "	3	16	
Queen's "	47	6	187
Lunenburg "	43	46	1,178
Totals..	7,649	1,538	2,486
Districts of Colchester Co.			
Truro	15		
Old Barns	162	2	4
Lower Stewiacke	9	3	
Onslow	10		
Upper Londonderry	616	15	40
Lower "	1,438	8	
Economy and Five Islands	1,441	2	
Totals	3,691	30	44
Districts in Hants Co.			
Windsor	59		
Scotch Village	15		
Falmouth	42		
Kempt	124	2	
Noel	161		
Nine Mile River	2		
Maitland	375	1	
Totals..	1,078	3	
Districts in Cumberland Co			
Amherst	301	2	
Head of Amherst	9	2	
River Hebert	321	2	
Wallace	1	2	
Mill Village	20	6	1
Totals	652	14	1
Districts of Kings Co.			
Canning	528		
Canard	148		2
Centreville	4	4	
Somerset	119	1	2
Kentville	44		
Gaspereau	28	2	
Wolfville	202		
Lower Horton	153		
Berwick	48	1	32
Totals	1,274	8	36

APPENDIX 6.

SUGGESTED FORM OF SHAD AND SALMON PERMIT.

No..... No.....

Stub to follow attached form.

Dominion of Canada.

Province of Canada.....

Department of Marine and Fisheries.

.....19... to 19...

SHAD AND SALMON GILL-NET PERMIT.

Issued under authority of the Fisheries Act.

The herein-named ..... resident of ..... now engaged in fishing shad and salmon, is hereby permitted to fish for shad and salmon in the waters of ..... with ..... fathoms of net..... meshes deep with mesh of ..... inches extension measure, from July 1, 191 to August 15, 191 .

The present permit requires strict conformity with the various provisions of the Fishery Laws and Regulations emanating from the Governor General in Council and directions by Fishery Officers; in default of such compliance the same will become void forfeited forthwith, saving moreover the penalties imposed by law.

This permit is not transferable.

The granting of this permit neither conveys nor implies any right or claim to its continuance beyond the period stated.

.. ..

For the Hon. Minister of Marine and Fisheries.

Countersigned and dated at.....

[The Regulations with penalties, &c., applying to this fishery to be printed as usual on the back of this permit.]

APPENDIX No. 7.

Suggested Form of Statistical Return of Annual Catch of Shad, Salmon and other Fish.

Date . . . . . 191.. Permit No. ...

Dominion of Canada.

Department of Marine and Fisheries.

Province of . . . . . County of . . . . . .

Fishery Inspector's District No ...

Return of Shad, Salmon and other Fish made by. . . . . .
. . . . . being taken by him in. . . . . under permit, from July 1 to Aug. 15, 191..

Name of Fish.	Number by Count.	Cwts.	Value.
			$ cts.
Shad.			
Salmon.			
Other Fish.			

Certified by. . . . . .

Received, Date. . . . . 191..

. . . . . .
Fishery Overseer.

at . . . . . .
County of. . . . . .

Date. . . . . 191.. Return under Permit No

Dominion of Canada.

Department of Marine and Fisheries.

Province of. . . . . County of. . . . . .

Fishery Inspector's District No. . . . .

Return of Shad, Salmon and other Fish made by. . . . . being taken by him in waters of . . . . . under permit valid from July 1, 191 . to Aug. 15, 191..

	Name of Fish.	Number by Count.	Cwts.	Value.
				$ cts.
	Shad.			
	Salmon.			
Other kinds of Fish				

I hereby certify that the above is a true and accurate return of Shad, Salmon and other Fish taken by me in the waters and in the time specified in Permit No . . . . .

To. . . . . (Signed) . . . . . .
Fishery Overseer.

at. . . . . .
County of . . . . . .

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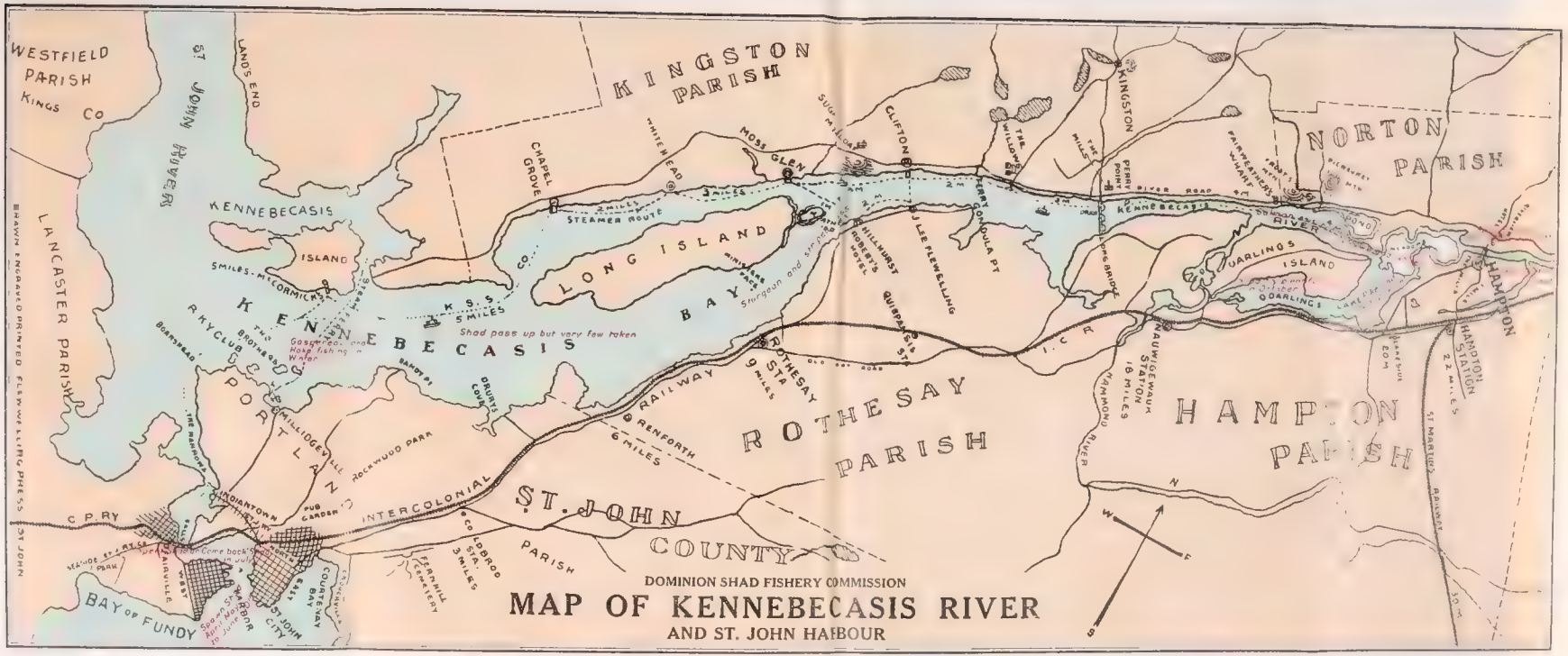
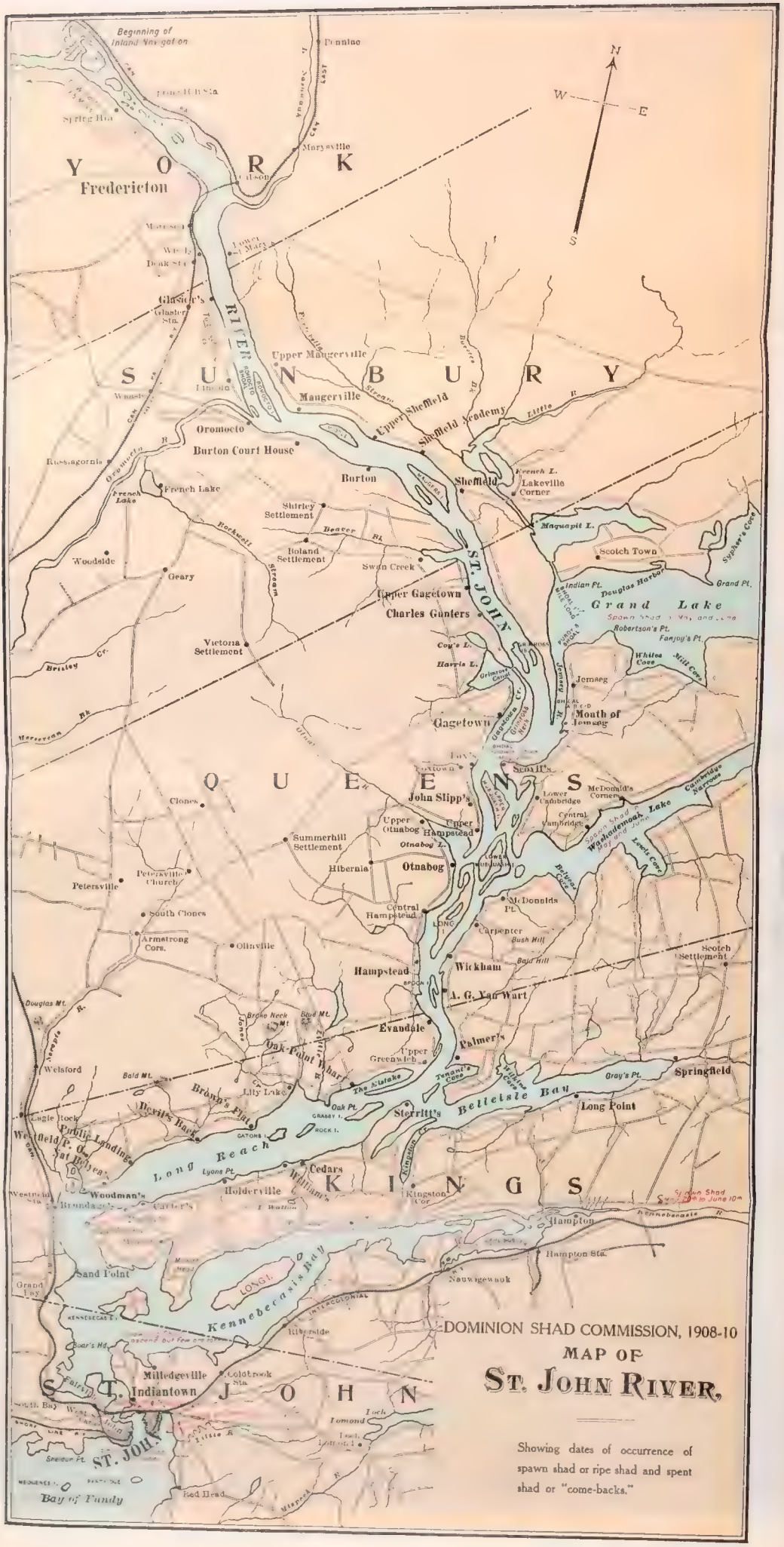

WESTFIELD PARISH
KINGS CO
ST JOHN RIVER
LANCASTER PARISH
LAND'S END
KINGSTON PARISH
CHAPEL GROVE
WHITE HEAD
MOSS GLEN
CLIFTON
KINGSTON
THE WILLOWS
THE MILLS
NORTON PARISH
PERRY POINT
FAIRWEATHER'S WHARF
RICHMOND
KENNEBECASIS RIVER
KENNEBECASIS ISLAND
3 MILES STEAMER ROUTE
LONG ISLAND
BAY
Shad pass up but very few taken
HILLHURST
ROBERT'S HOTEL
J LEE FLEWELLING
QUISPAMSIS STA
LONG BRIDGE
DARLINGS ISLAND
HAMPTON
HAMPTON STATION
22 MILES
ROTHESAY
9 MILES
RENFORTH
6 MILES
I C R
RAILWAY
ROTHESAY PARISH
HAMPTON PARISH
HAMMOND RIVER
MILLIDGEVILLE
ROCKWOOD PARK
DRURYS COVE
BOARDSHEAD
THE RAMPARTS
PORTLAND
INDIANTOWN
PUB GARDEN
C P RY
INTERCOLONIAL
ST JOHN COUNTY
PARISH
FERNHILL CEMETERY
COLDBROOK STA
3 MILES
BAY OF FUNDY
ST JOHN CITY
COURTENAY BAY
DOMINION SHAD FISHERY COMMISSION
MAP OF KENNEBECASIS RIVER
AND ST. JOHN HARBOUR



DOMINION SHAD COMMISSION, 1908-10

MAP OF ST. JOHN RIVER,

Showing dates of occurrence of spawn shad or ripe shad and spent shad or "come-backs."

DOMINION SHAD FISHERY COMMISSION, 1908-1910

MAP OF BAY OF FUNDY

With tributary waters, showing dates of occurrence of spawn shad (in ripe condition or ready to spawn) and of fall summer and fall shad, also of the poor emaciated "come-back" shad after spawning.

SH
351
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Canada. Shad Fishery
Commission
Report and recommendations

Biological
& Medical

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